REPORT

OF THE

SESQUI-CENTENNIAL COMMITTEE

OF THE

ENGINEERS' CLUB OF PHILADELPHIA

ON SITES

TO THE PRESIDENT
AND
THE EXECUTIVE COMMITTEE
OF THE
SESQUI-CENTENNIAL EXHIBITION ASSOCIATION

REPORT

OF THE

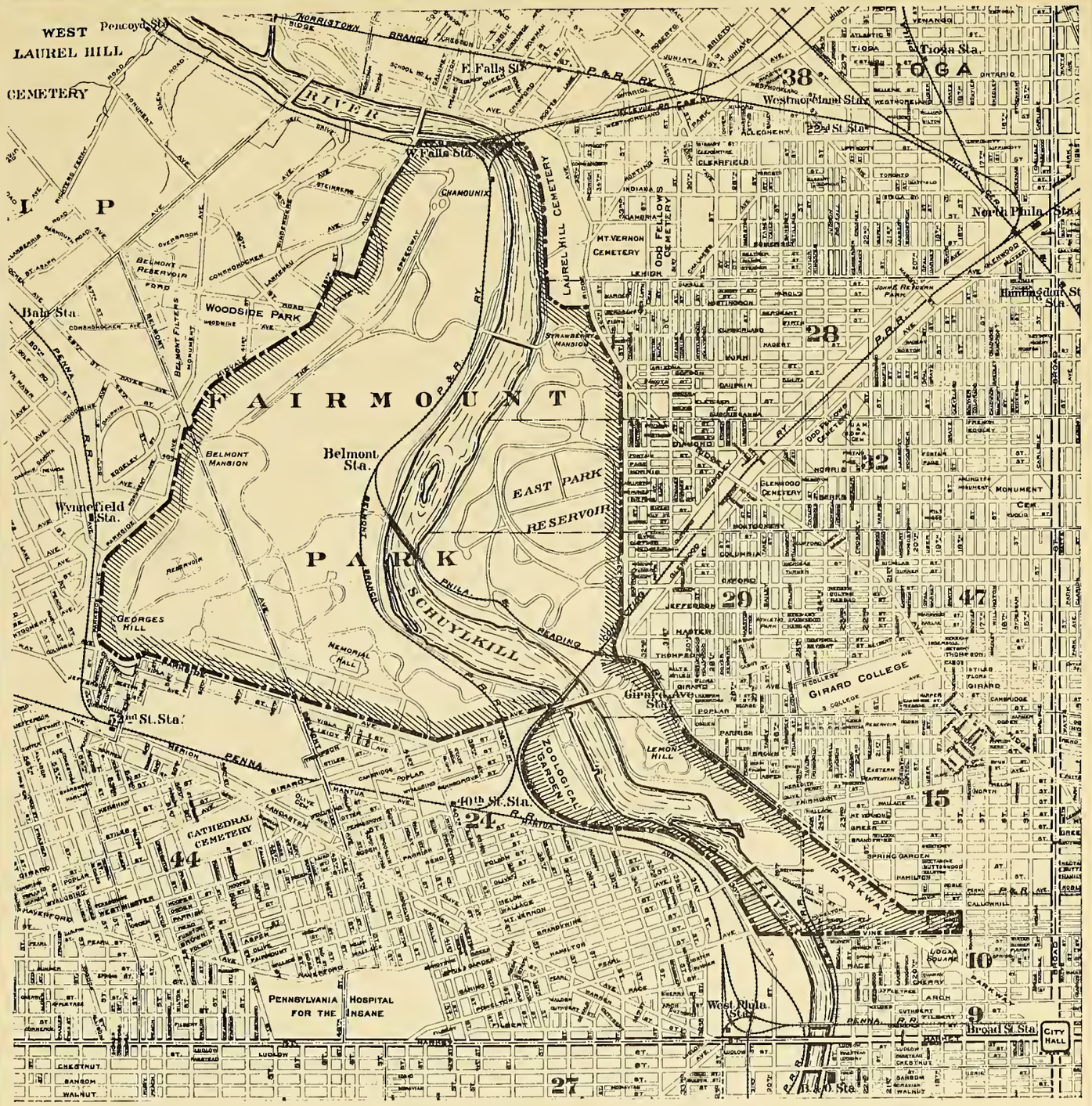
SESQUI-CENTENNIAL COMMITTEE

OF THE

ENGINEERS' CLUB OF PHILADELPHIA

ON SITES

PHILADELPHIA
JANUARY 25, 1922



MAP OF
FAIRMOUNT PARK AND A PORTION OF THE PARKWAY ~

The following Joint Resolution Indicates the Exposition Site Region Recommended by the Sesqui-Centennial Committee of the Engineers Club of Philadelphia:

"It is unanimously recommended that a territory from Vine Street – including the Parkway and Park – as far as is essential for the purpose (including territory on both sides of the river, if needed) is the most desirable site for the Sesqui-Centennial. If the City acquires other contiguous land in the meantime which can be used advantageously in connection with this site, it may be added."

N

—· NOTE ·—

Approximate Area of **Territory** (excluding River):
2100 ACRES

Approximate A· **Required:**
600 ACRES

Accompaning Report of Sesqui-Centennial Site Committee of
THE ENGINEERS CLUB OF PHILADELPHIA
January 1922

PLATE I

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PLATES

January 26, 1922.

MR. EDWARD ROBINS, Secretary *pro tem.*,
The Sesqui-Centennial Exhibition Association,
Bellevue-Stratford,
Philadelphia, Pa.

DEAR MR. ROBINS: Again referring to your letter of December 7, 1921, transmitting the request of your Executive Committee that the Engineers' Club submit suggestions concerning the matter of a site for the Exposition, we are pleased to hand you herewith the results of a comprehensive engineering examination of the various sites which have been brought to our attention.

This report was prepared by our Sesqui-Centennial Committee and represents a careful study of the general scope and requirements of an extensive international exposition, as well as a consideration of the many engineering problems involved in its planning and construction.

For your convenience the report has been arranged as follows:

1. A general summary of the Committee's findings by the Chairman, Col. John Price Jackson.
2. A more detailed summary by the Correlation Committee, consisting of the Chairmen of the various subcommittees.
3. The complete reports of the several subcommittees covering the particular engineering considerations assigned to each.

The energy and enthusiasm with which our Committee has applied itself to this task is typical, we believe, of the energy and enthusiasm with which the people of the City and of the Nation will apply themselves to this great commemorative event just as soon as your Association has cleared the way for action. We trust that we have succeeded in our earnest desire to aid in clearing the way and that this report will serve the purpose the Executive Committee had in mind in asking our co-operation.

We thank the Association for the opportunity which it has given us to be of service to the Sesqui-Centennial movement and will gladly assist further in any way within our power.

Respectfully submitted,
(Signed) W. F. JAMES,
President, Engineers' Club of Philadelphia.

January 25, 1922.

MR. W. F. JAMES, President,
Engineers' Club of Philadelphia,
Philadelphia, Pa.

MY DEAR MR. JAMES: I enclose herewith a copy of the report made by the Sesqui-Centennial Committee of the Engineers' Club of Philadelphia.

In making this submission I beg to express my high appreciation of the patriotic service of the men you appointed to act with me upon this Committee, and their spirit of co-operation. I particularly desire to draw your attention to the devoted and untiring labors of the various subcommittees which you constituted from and as an integral part of your general Committee, and to the helpfulness of the Secretary of the Club.

Permit me also to express appreciation of the invaluable and constant aid you gave us in every phase of our endeavors, and to congratulate you upon the judgment you used in appointing members, to serve with the Chairman, who were particularly qualified by experience and sound judgment to perform the special functions assigned to them.

Yours faithfully,
(Signed) JOHN PRICE JACKSON,
Chairman, Sesqui-Centennial Committee,
Engineers' Club.

SESQUI-CENTENNIAL COMMITTEE

OF THE

ENGINEERS' CLUB OF PHILADELPHIA

Jackson, John Price, *Chairman*

Ballinger, Walter F.
Boyd, D. Knickerbocker
Crawford, Andrew Wright
Dallett, W. P.
Easby, M. Ward
Eglin, W. C. L.
Fairchild, C. B., Jr.
Fernald, Robt. H.
Foster, Benj. P.
Franklin, Benjamin
Horton, R. H.
Kilpatrick, J. L.
Lindsay, A. R.
Meigs, John
Parker, William P.
Penrose, Charles
Pike, Clayton W.
Plack, W. L.
Prendergast, R. A.
Quimby, Henry H.
Sanford, W. H.
Serrill, Wm. J.
Sloan, S. A.
Stamm, Norman L.
Steinmetz, J. A.
Swaab, S. M.
Temple, E. B.
Twining, W. S.
Vogleson, J. A.
Wagner, Joseph C.
Wagner, Samuel T.
Wood, A. C.
Yarnall, D. Robt.
Sanville, H. F.

D. E. Dallam,
Representing the Real Estate Board of Philadelphia

John T. Windrim,
Representing The American Institute of Architects, Philadelphia Chapter

REPORT

OF THE

SESQUI-CENTENNIAL COMMITTEE OF THE ENGINEERS' CLUB OF PHILADELPHIA

HON. J. HAMPTON MOORE, *President,*
AND MEMBERS OF THE EXECUTIVE COMMITTEE,
The Sesqui-Centennial Exhibition Association,
Bellevue-Stratford,
Philadelphia, Pa.

GENTLEMEN:

The Sesqui-Centennial Committee of the Engineers' Club of Philadelphia, appointed in response to your letter to the President of the Club of December 7, 1921, for considering sites for the proposed Exposition of 1926, begs to submit this report. It comprises this summary and appendices given hereafter.

A copy of your letter, also the details of the organization and plan of procedure of the committee with its personnel, will be found in Appendix A. It will be seen by turning to this reference that the Committee was subdivided into groups in a manner to obtain the most effective use of the experience of its members and to concentrate attention upon the important problems involved.

After extended study of the problem by the Committee as a whole and its several sub-divisions, personal investigation of each site, consideration of the engineering features involved, and consideration of parallel information from the Philadelphia Chapter of the American Institute of Architects and the Real Estate Board (further details of which will be found hereafter) the following *summary of the findings* is submitted:

REGIONS UNDER CONSIDERATION.

Fairmount Park and Parkway Region.

The Fairmount Park and Parkway region was found, after all influencing features involved had been carefully weighed, to rate highest in net advantages as a territory within which the site for the Exposition can be located. (Plate I shows this region and its environs.)

This decision, after independent investigation, was concurred in by the committees of the Architects and the Real Estate Board in a resolution, passed jointly by those two bodies and the Engineers' Committee, which specified this region as of highest rating in these terms:

> "It is unanimously recommended that a territory from Vine street—including the Parkway and Park—as far as is essential for the purpose (including territory on both sides of the river, if needed) is the most desirable site for the Sesqui-Centennial. If the City acquires other contiguous land in the meantime which can be used advantageously in connection with this site, it may be added."

For purposes of the report this region is hereafter designated the Fairmount Park-Parkway Plan. It includes as much of the Lower Fairmount Park or "Cret" site, above Vine Street, the Upper Fairmount Park site, and other parts of Fairmount Park as may be found necessary when the actual plans for the Exposition are being made (see page 2). The two sites named above were those originally proposed for the location of the Fair in this region. For information concerning them see Plate II and the appendices to the report, especially Appendix B.

The Engineers' Committee believes that the primary and striking advantages of this region are its accessibility; its adaptability for the creation of a World's Fair development of surpassing beauty; and the possibility of the use and construction of buildings which will be of large permanent value to the City after the Fair is over. The accessibility of the location would add a material percentage to the income of the Fair, through admissions and the value of concessions, as compared with sites less centrally situated. From the aesthetic standpoint the location in this region would make possible the utilization of the most beautiful park development in this country, if not in the world. The proper use of portions of the Parkway would forward construction of the great permanent and needed structures planned for that magnificent thoroughfare, and would likely leave it so developed that it would become a competitor in beauty and dignity with the Champs Elysee in Paris, now generally recognized as the most beautiful existing boulevard.

Further, the Art Gallery, National Government, and State Buildings, and other permanent structures contemplated for the Parkway—which can be completed and adapted for the purposes of the Exposition—may be found to serve as a method of reducing the number of temporary structures, as they represent an important amount of floor space.

A site in this region could readily have entrances which would give easy access from the south and east portions of the City, from West Philadelphia, and from North Philadelphia; and the Park being a source of rightful pride and interest to all of the people of the City, its acceptance for the site should result in all sections of the City joining in the enterprise with equal enthusiasm and civic pride. With regard to housing and caring for visitors, the region has been ranked first, and it is acceptable from the standpoint of transportation, water supply, sewage disposal, comfort, health, etc.

Destruction of foliage, interrupted public use of the Park, and interference with the regular avenues of city travel, have been pointed to, and they, with other disadvantages which have been suggested, have been given careful consideration by the Committee. Investigation has led the Committee to believe that a net advantage will come to the Park in the form of improvements, if the Exposition is located there. Further, the Fair being a project of all the people and of intense interest, both its construction and open period will draw to the park much greater numbers of our people than would normally be the case. It should be remembered also that only a relatively small fraction of the Park area is needed for Fair purposes.

More detailed specifications with regard to the advantages and disadvantages of this region and other suggestions concerning the use of Fairmount Park, will be found in Appendix B.

The specification given in the resolution, quoted earlier, concerning territory within the limitations of which the Exposition may be suitably placed, is made broad, as the specific boundaries of the Fair must be determined when the architectural and landscape plans are prepared, and those responsible therefor should of course have as large leeway as possible. Further, the Exposition engineers and architects should be in a position to avoid placing excessive expense upon the Fair project in the form of sewerage development, covering and electrifying railroads, condemnation of valuable property, etc. However, there are improvements along the Schuylkill contiguous to the territory proposed, involving the condemnation of land and improved sewerage disposal which, when accomplished, might be of great advantage to both the City and Exposition. Their prompt undertaking by the City is submitted for the consideration of the municipal authorities.

Although your request was for recommendations concerning sites, the consideration of this problem has of necessity involved a study of the probable features and general scope of the Exposition. Results of this study are to be found among the appendices, but the following suggestions are submitted here for consideration in connection with the site recommended by the Committee to be most desirable. Thus, there are two elements of national and international activity of much importance, which are not from the architectural or physical standpoints readily adapted to the central main group of buildings of an international exposition, but which it is believed should be developed as co-ordinate exhibits. These are an exhibit dealing with the practice and problems of marine transportation and activities. and another for showing agricultural processes and methods.

It is suggested by the Committee that an exhibit including possibly full-sized boats equipped for various types of marine service, and other large marine exhibits, may be located to advantage at or near the Philadelphia Navy Yard at League Island. It is probable that the United States Government, or the United States Shipping Board, would undertake to carry through a project of this kind. Undoubtedly a great proportion of our American visitors attending the Fair would welcome the opportunity to visit such a display, as well as the Navy Yard, where a naval exhibit could also be included. This feature would undoubtedly aid the Nation in the development of its merchant marine.

The agricultural exhibit suggested should be a working educational display of agricultural methods, as distinguished from the exhibit of agricultural products, which will probably be within the main Fair groups. It might include dairying; barns; agricultural apparatus in actual operation on the ground, including numerous contests of interest; live-stock of all varieties; plots devoted to the growth of food products of this and other countries, with which the people are not commonly acquainted; etc. For this exhibit the rolling lands offered in suggested site regions in the northern sections of the City would no doubt be best adapted.

One of the material advantages of these suggestions rests in the fact that they would cause great numbers of the visitors to traverse the magnificent river drive in the Park, as well as northern and southern Broad street, and become impressed by the substantial character, extent, and beauty of our great City.

Northern Region.

Considered for the main Exposition, the regions of the various sites to the north of the City center have been rated second by the Committee. They include the Pennypack Park, upper Roosevelt Boulevard, lower Roosevelt Boulevard, Juniata and Tacony

Park, and Roxborough sites. For their location see the map in Plate II. In most cases these sites lend themselves, from the aesthetic standpoint, to beautiful development. They are rolling in character, and in general contain sufficient water to enable marine features to be added in landscaping. In these sites transportation can be arranged which will serve the needs of probable attendance at such locations, as can also the disposal of sewage and the supply of drinking and other water for exhibit purposes. They are of reasonably high elevation, and in that regard meet requirements regarding the comfort and health of visitors. The character of the ground would enable the necessary foundations for the Fair buildings to be constructed without excessive cost. The placing of the Fair at any one of these sites also would tend to the rapid development of the City near the Fair location.

On the other hand, the sites are distant from the center of the City, and are as a result not as accessible, nor would they draw the attendance or make the concessions as valuable as in the case of a site in the Fairmount Park-Parkway region.

The Committee's relative rating of the various sites named in this class and the detailed reasons for such ratings will be found in Appendix B.

Southern Region.

The southern sites are in a region fitted to become a highly developed and valuable part of the City. They have many advantages, but these are offset by certain conditions, having to do specifically with the time set for and the character of the Exposition, which have caused the Committee to rate them in a third group. They include two sites near League Island Park, and the United States Shipping Board, the Fortieth Ward, and Cannonball Farm sites. For their location see the map in Plate II.

The southern League Island Park site has the great advantage of lying close to the Philadelphia Navy Yard, which in itself is a national attraction of large value, and this site has a magnificent stretch of frontage on the Delaware River, as has also the United States Shipping Board location. The League Island site is not far removed from the center of the City, and could be reached without serious difficulty, although not as accessible from all quarters as is the Fairmount Park-Parkway region.

All of these southern sites, however, would require large sums for grading to prepare them for the specific needs of the Exposition, and in connection with this much time needed urgently for actual construction would be required to get the ground into condition to begin operations. They are not readily adapted to easy treatment from the aesthetic standpoint, because of their flat character, nor would they draw the attendance and income which would come to a site more centrally located, with better entrance from all parts of the City.

The relative rating of the various sites in this group and other characteristics will be found in Appendix B.

AVIATION AND CERTAIN OTHER ITEMS.

Methods of transportation by air will without question be a matter of great importance, and there will undoubtedly be extensive exhibits of apparatus relating to this modern development in the main part of the Exposition. There will doubtless also be much use of airplanes for the transportation of visitors from a distance. Air-field facilities have not, however, been considered as a necessary part of a site by reason of the fact that it is believed wise to locate them at available and practicable points, preferably not contiguous to the Exposition grounds.

On the other hand, the parking of automobiles close to and in the grounds, and arrangements for those who desire to camp out, have been given full consideration and weight in the findings, as have also many other requirements of a great exposition, such as handling the masses of people, easy transportation between buildings, etc., dealt with hereafter but not spoken of above. In like manner, in deciding matters relating to attendance and income, the value of concessions, etc., careful study has been made of the results obtained at other expositions. It was recognized by the Committee that the parking and handling of automobiles would be a large project and extended consideration was given it. Careful computation and study, however, led the Committee to the conclusion that all of the regions proposed would lend themselves to a solution of this problem, if parking space was subdivided and appropriately placed near all entrances and at convenient points in the Fair grounds.

A more full discussion of the findings of the Committee with regard to all of the sites studied will be found in Appendix B, which is a joint report of the chairmen of the subcommittees. The reports of the subcommittees themselves will be found in Appendices C, D, E and F, and go into greater detail with regard to special features, such as transportation; civil engineering subjects, including health and comfort; power and lighting service; communication; information concerning previous fairs; etc.

A list of the proposed sites studied and reported upon in the appendices is found below:

LIST OF SITES STUDIED.

The sites which are named below and which were given consideration by the Engineers' Committee will be found on Plate II. With each designation is also given herein the approximate acreage available and distances from City Hall.

The following is the listing arranged in the groups dealt with heretofore:

FAIRMOUNT PARK-PARKWAY REGION.

Fairmount Park-Parkway Plan.

May comprise such parts of the Park and Parkway above Vine street as needed; all City-owned except such private property as the City may find it wise to take along the Schuylkill river banks, or elsewhere, when the plans for the Exposition are drawn. Nearest point about two miles from City Hall.

Lower Fairmount Park, or "Cret" Plan.

214 acres; part City, part railroad, and part privately owned. Adjacent available property, 600 acres. Two miles from City Hall.

Upper Fairmount Park (former Centennial Site).

750 acres; all City-owned. Four miles from City Hall.

NORTHERN REGION.

Pennypack Site (three, in or adjacent to Pennypack Park).*

Site No. 1—2,000 acres; all City-owned. Site No. 2—7,000 acres; 2,000 City-owned, 5,000 privately owned. Site No. 3—1,000 acres; 500 City and 500 privately-owned. All sites approximately ten miles from City Hall.

Roxborough Plan.

2,000 acres; all privately-owned. Nine miles from City Hall.

*Upper Roosevelt Boulevard Plan (west side of boulevard).**

1,000 acres, all privately-owned. Eight miles from City Hall.

*Lower Roosevelt Boulevard.**

700 acres; part privately and part City-owned. Six miles from City Hall.

*Juniata and Tacony Park Plan.**

600 acres; part City and part privately-owned. Five miles from City Hall.

SOUTHERN REGION.

League Island Park Plan.

963 acres; 300 City, 559 railroad, and 104 privately-owned. Available adjacent acres, 669. Four miles from City Hall.

Alternate League Island (immediately north of League Island Park Plan).

800 acres; all privately-owned. Three miles from City Hall.

United States Shipping Board Plan (denominated on the map "Hog Island Plan").

846 acres; owned by the Federal Government. Available adjacent property, 1,000 acres. Seven miles from City Hall.

Cannonball Farm Plan.

1,800 acres; part private and part City-owned. Six miles from City Hall.

Fortieth Ward Plan (immediately north of Cannonball Farm).

1,000 acres; all privately-owned. Five miles from City Hall.

The individuals or organizations which have proposed these several sites will be found in a list contained in Appendix C. There will also be found reproductions of plans or views of the Lower Fairmount Park or Cret, League Island Park, Roxborough, Upper Fairmount Park, United States Shipping Board (or Hog Island), and Pennypack Park plans, in Plates V, VI, VII, VIII, IX, X. Plate I gives a map of the Fairmount Park-Parkway region.

ELEMENTS AFFECTING AN INTERNATIONAL EXPOSITION.

In order that the Committee might consider the problem of a territory of suitable characteristics and size for an international exposition it was essential that it gather information concerning previous fairs of similar character, and from this data, and by comparative studies of the conditions which exist in Philadelphia, set forth the fundamental conditions which must be met. Details concerning past fairs and local fundamental conditions may be

*Proponents later joined in recommending Pennypack region site.

obtained by reference to Appendix C, and particularly to Plate IV, which comprises a tabulation of information concerning a number of previous expositions.

BUILDINGS AND TERRITORY.

From the study thus made it was decided that the following buildings or their equivalent will be essential to a proper presentation of the world advances which have been made during the past fifty years: Manufactures and Liberal Arts; Machinery, including Electricity; Mines, Metallurgy and Chemistry; Transportation; Agriculture; Fisheries; Food Products; Horticulture; Music, including an Auditorium; Art Gallaries; Education; Anthropology; United States Government Buildings; Administration Building; Pennsylvania Building; State Buildings; Foreign Buildings; Building Arts; Stadium and Drill Grounds; and necessary buildings for amusements.

It was estimated that the main group of buildings of suitable size included above would require 100 acres of space, and that there would be other buildings incidental but necessary to the group which would increase the area to possibly 150 acres. The minimum space for properly setting these buildings, it was estimated, would require 150 acres more, or a total of 300 acres. To this area should be added from 300 to 500 acres additional to provide for various other services, which make a total of from 600 to 800 acres, as the estimated territory required.

The 300 acres needed for the main group should be in one plot, and it is preferable to have the 600 to 800 acres together.

In discussing the Fairmount Park-Parkway site, which received the highest rating from the Committee, 300 acres, with additional space for parking, athletic events, ethnological and zoological exhibits, etc., would doubtless answer the necessities of the case. If the auxiliary exhibits of marine transportation and agricultural methods are placed respectively at League Island and in the northern portions of the City, as suggested earlier, their requirements need not, of course, be included in the location for the main Exposition. It is altogether probable that it would be desirable, in preparing an exhibit of agricultural methods, to cover a comparatively wide territory.

ATTENDANCE.

The Exposition at Chicago is reported to have had a total of 21,480,000; St. Louis, 12,804,000; San Francisco, 13,127,000; Paris, 1889, 25,398,000; Paris, 1900, 37,287,000 paid admissions. Reference to the tabulations on Plate IV will give the ratio of the local population to total paid admissions.

The population within the boundaries of Philadelphia proper is about 1,800,000; within a radius of 25 miles from City Hall, 2,500,000; within a radius of 50 miles from City Hall, 7,500,000, and within a radius of 400 miles, 37,300,000 (Plate III).

A careful consideration of this and similar data has led the Committee to decide that an average attendance of about 200,000 visitors per day should be anticipated in selecting a site. It is also believed that preparation should be made for daily variation of attendance ranging between a minimum of about 75,000 and a maximum of about 400,000.

Judging by past expositions, and to use the assumption that the Fair will be open 200 days, it is estimated that it should be possible to make it so attractive as to obtain a total attendance comparable with that of the Paris Exposition of 1900. To the income derived from attendance will, of course, be added that received from concessions. In past expositions in America income derived from this source has varied from about 20 per cent. to as high as about 50 per cent. of the income from attendance. It should be understood that the attendance not only affects the income of the Fair directly, but has an important bearing upon the problems of transportation, acreage, cost, etc. (See Appendix C and Plate IV.)

COST OF EXPOSITION.

The cost and preparation of the site, and the further cost of erecting and operating the Exposition, are more or less intertwined, and an intelligent estimate of the outlay which will be required is an essential consideration in determining a site.

The following data with regard to the four largest world's fairs which have been held are valuable in this connection, but discussion is required because of varying methods of accounting.

Chicago—Total cost of grounds and buildings, $18,678,000; gross outlay, $27,292,000.

St. Louis—Total cost of grounds and buildings, $16,704,000; gross outlay, $26,464,000.

San Francisco—Total cost of grounds and buildings, $14,847,000; gross outlay, $25,865,000.

Paris, 1900—Gross outlay, $20,609,000.

Your Committee has instructed us to consider a site for an exposition which will be distinguished for great perfection, and such an exposition will undoubtedly be expected by the people

of the United States. Consideration, therefore, of the largely increased prices of materials and labor, and with the Chicago Exposition as a reasonable type as to the size and character of the project, indicates that the gross outlay may be fairly figured upon a basis materially larger than at that previous exposition.

As a matter of incidental information, in connection with the above figures, the tabulation showing appropriations or subscriptions raised by Cities, States, and the Nation, for several expositions in this country, as set forth in Appendix C, are of interest.

OTHER FACTORS OF IMPORTANCE.

In addition to area of territory, attendance and cost, there are many other features essential to the success of an international exposition which directly affect the selection of a site. Comments on and an analysis of the requirements of such an exposition will be found in Appendix C. The principal classifications under which these factors may be appropriately listed are: procurability of the site; accessibility, including its effect upon attendance and income; civil engineering features, including water supply, sewage, topography, etc., and comfort and health; transportation, which is closely allied to accessibility, and is, of course, a subject of utmost importance, including not only the various types of transportation, and garaging and parking of vehicles, air-fields, etc., but also that of quickly disposing of crowds at entrances and on the grounds; power, light and communication; feeding and housing of visitors, which involves the matter of hotels, restaurants, apartment houses, boarding houses, etc.; and facilities for exhibits of wide variety of character and requirements.

Of no less importance are the subjects of aesthetics, as relating both to the beauty of the site and its picturesqueness, the views therefrom, and the views along the transportation routes and the immediate Fair surroundings; the salvage which may be expected after the Fair, in the form of permanent buildings, parks, bridges, monuments, waterlines, etc.; and a number of items such as the permanent effect upon the valuation and growth of the City, the attitude of the people toward the Exposition, etc.

METHODS.

The Engineers' Committee, as a whole called the General Committee, was divided into Subcommittees on Statistics; Civil Engineering; Transportation; Power and Light; Central Station Service; Communication; Liaison with the Philadelphia Real Estate Board and the Philadelphia Chapter of the American Institute of Architects; Public Information; Scope; and Correlation. An Executive Committee, including the subcommittee chairmen, had general supervision.

To the subcommittees were assigned the appropriate divisions of the work—indicated in the preceding section of this report—and their membership was constituted as before stated, with particular reference to the experience necessary to wisely weigh the various factors involved.

Each subcommittee gave thorough study to the portions of the project assigned to it, placing, where this was possible, numerical weights upon each element for the several sites, in order that accurate comparisons might be made, and followed this detailed study by a careful summation of its findings. The subcommittee reports having to do with divisions of the work were carefully considered by the Correlation Committee, which was composed of subcommittee chairmen, and after weighing the data and information at hand the findings reported herein, and at somewhat greater detail in Appendix B, were determined upon. Throughout the task there were frequent working meetings of the Executive and General Committees. The organization and subcommittee reports, heretofore indicated to be part of this report, are to be found in Appendices B, C, D, E and F.

Respectfully submitted,

SESQUI-CENTENNIAL COMMITTEE OF THE
ENGINEERS' CLUB OF PHILADELPHIA.

By JOHN PRICE JACKSON,
Chairman.

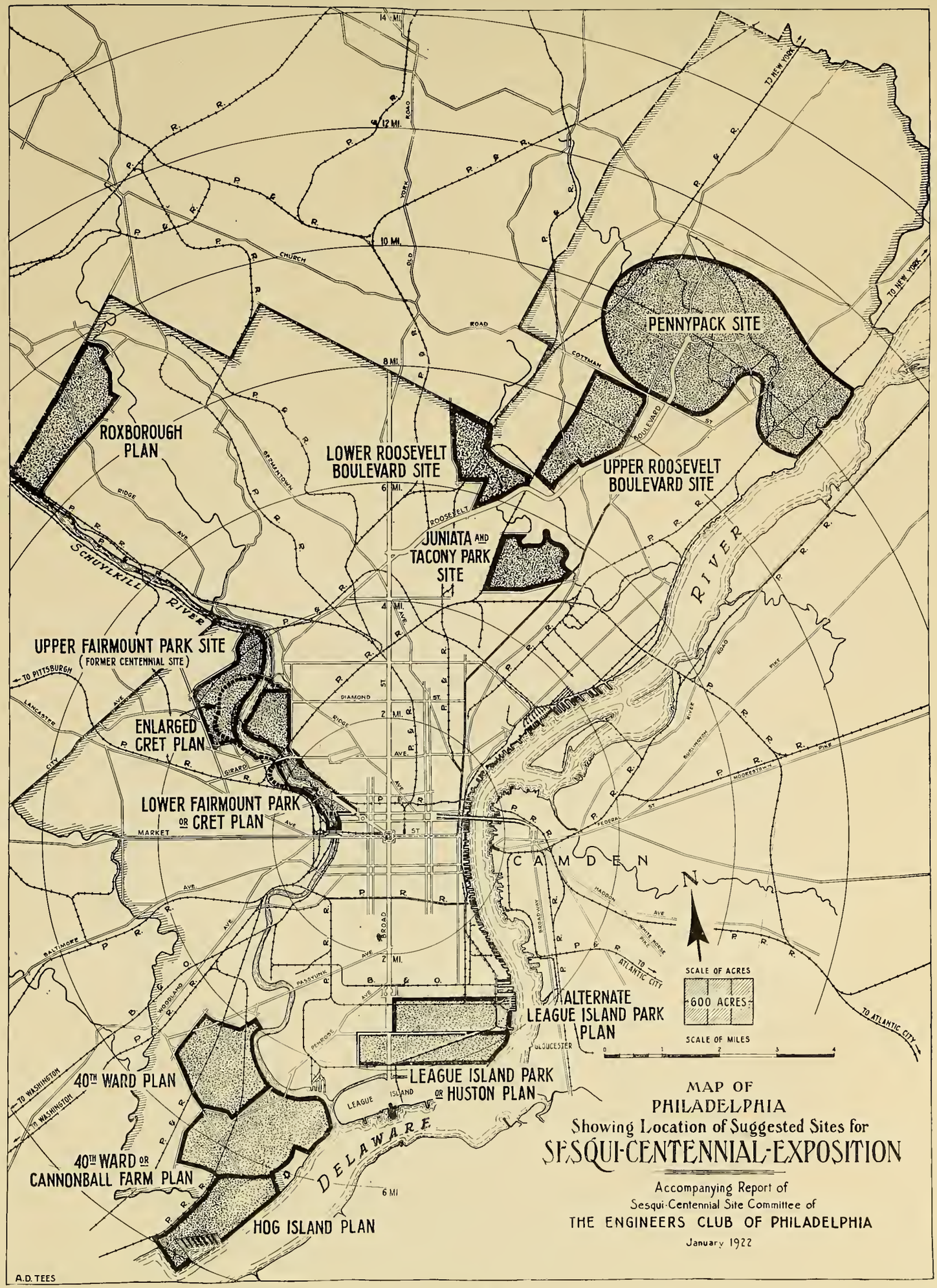

PENNYPACK SITE
ROXBOROUGH PLAN
LOWER ROOSEVELT BOULEVARD SITE
UPPER ROOSEVELT BOULEVARD SITE
JUNIATA AND TACONY PARK SITE
UPPER FAIRMOUNT PARK SITE
(FORMER CENTENNIAL SITE)
ENLARGED CRET PLAN
LOWER FAIRMOUNT PARK OR CRET PLAN
ALTERNATE LEAGUE ISLAND PARK PLAN
LEAGUE ISLAND PARK OR HUSTON PLAN
40TH WARD PLAN
40TH WARD OR CANNONBALL FARM PLAN
HOG ISLAND PLAN
SCHUYLKILL RIVER
DELAWARE RIVER
CAMDEN
TO NEW YORK
TO PITTSBURGH
TO WASHINGTON
TO ATLANTIC CITY
SCALE OF ACRES
600 ACRES
SCALE OF MILES
MAP OF
PHILADELPHIA
Showing Location of Suggested Sites for
SESQUI-CENTENNIAL-EXPOSITION
Accompanying Report of
Sesqui-Centennial Site Committee of
THE ENGINEERS CLUB OF PHILADELPHIA
January 1922
A.D. TEES

PLATE II

APPENDIX A

AUTHORIZATION, ORGANIZATION AND PERSONNEL

PART I.

LETTER OF REQUEST FROM THE EXECUTIVE COMMITTEE OF THE SESQUI-CENTENNIAL EXHIBITION ASSOCIATION.

December 7, 1921.

Mr. William F. James, *President,*
The Engineers' Club of Philadelphia,
1317 Spruce Street, Philadelphia.

Dear Mr. James: The by-laws of the Sesqui-Centennial Exhibition Association vest in its Board of Directors the selection of a site for the Exposition. Consideration of the subject of site will be primarily by the Executive Committee. At a meeting of the Executive Committee on Tuesday, December 6th, I was instructed to request the Engineers' Club of Philadelphia to submit to the Committee suggestions as to the site recommended by it. A similar request is being made to the Philadelphia Chapter of the American Institute of Architects and to the Philadelphia Real Estate Board. The Committee feels that your advice in this matter will aid materially in this great enterprise. The very gracious and practical way in which your organization has already shown its interest in the cause of the Exhibition prompts us to feel justified in making this request.

Trusting that you will give the Executive Committee the benefit of your counsel, I am.

Very sincerely yours,

EDWARD ROBINS,
Secretary, pro. tem.

PART II.

TENTATIVE PLAN OF PROCEDURE.

STATEMENT PREPARED BY THE PRESIDENT, WILLIAM F. JAMES, AND ADOPTED BY THE BOARD OF DIRECTORS OF THE PHILADELPHIA ENGINEERS' CLUB ON DECEMBER 13, 1922.

December 14.

Address attached notice to all members of the Club.

December 15.

Meeting of Executive Committee for organization and establishing responsibilities for the several subcommittees.

First period..... to .....

SUBCOMMITTEES AND THEIR DUTIES.

Statistics.

Secure and tabulate complete statistics concerning previous world expositions and such other data as may be determined upon at the organization meeting. Prepare such maps, charts, etc., as may be required, including the master map of the City which is to be located in the main lounging room of the Clubhouse and to show clearly the areas considered as available for exposition purposes, indicating the City-owned properties and data submitted by the Real Estate Board.

Civil Engineering.

Without regard to specific sites to be considered later, formulate the fundamental requirements in the matter of topography, character of ground, water supply, sewerage, etc.

Liaison.

Real Estate Advisory—Secure for the use of the Statistics Committee such information as is necessary concerning areas considered as available by the Real Estate Board and in general become acquainted with the procedure of the Committee of that Board.

Architectural Advisory—Secure for the Committee as a whole the architectural requirements upon which the Committee of the Philadelphia Chapter, American Institute of

Architects may base its recommendations as to site, also such technical data as may be required by the Civil Engineering Subcommittee.

Executive.

Assure activity and consider the various proposals and suggestions made by the Club membership at large.

Second period ..... to .....

SUBCOMMITTEES AND THEIR DUTIES.

Statistics, Liaison and Executive.

Continue as during first period and take such action as developments indicate to be desirable.

Civil Engineering.

Investigate the specific areas which have been found available and rate them in accordance with the degree to which each approaches the fundamental requirements as previously determined during the first period.

Transportation.

Consider the specific areas which have been found available and rate them in accordance with their conformation to existing and expected natural growth of transportation facilities, also by the extent of temporary facilities required to make such areas available from the transportation point of view.

Power Plant.

Consider and rate the specific areas under consideration from two angles, first assuming use of central station power and second on the basis of isolated plant. A further rating should be possible, assuming combined central station and isolated plant service. Ratings should, as in the case of transportation, be in accordance with the conformation of the various areas to existing and expected natural growth of power facilities, also by the extent of temporary facilities required to make such areas available from the power requirement point of view.

Third period ..... to .....

FINAL DUTIES.

General consideration of all subcommittees, reports, suggestions by members and the preparation of a final report to be submitted to the Executive Committee of the Sesqui-Centennial Exhibition Association after final approval as to form and adequacy by the Board of Directors of the Club.

AN ANNOUNCEMENT OF UNUSUAL INTEREST.

The Club is happily confronted with an opportunity to render a distinct public service in the preliminary planning of the Sesqui-Centennial celebration which will soon let loose industry and during 1926 bring the world to Philadelphia.

As individuals we have ofttimes deplored the apparent lack of action in connection with this great project. Now action is waiting upon us, as the Executive Committee of the Sesqui-Centennial Exposition Association has requested the Club to assist it with engineering advice in the selection of a suitable site upon which to proceed with what will be the greatest of expositions.

In order that all our members may have an opportunity to assist in maintaining this advanced position the Club has taken in public affairs a large map of Philadelphia and adjacent territory has been placed upon the wall of the main lounge room of the Clubhouse and as quickly as possible all the areas considered available as sites will be clearly indicated. Exposition statistics will be added from time to time as made available.

You are asked to make it a matter of definite obligation to get into the Club frequently to study the situation and talk it over, then put your thoughts and suggestions into writing, not only as regards site but concerning the general scope, plan and desirable features of the Exposition. You are assured the Club committees on the Sesqui-Centennial will consider all such assistance and suggestions in preparing its report.

Prompt action is essential and all communications should be addressed to Mr. C. E. Billin, Secretary, The Engineers' Club of Philadelphia.

PART III.

SESQUI-CENTENNIAL COMMITTEE ENGINEERS' CLUB OF PHILADELPHIA.

(Appointed by W. F. James, the President of the Club)

GENERAL COMMITTEE.

(The list below includes the full membership of the General Committee and its division into subcommittees)

John Price Jackson, *Chairman.*

MEMBERS-AT-LARGE.

J. A. Steinmetz.
Joseph C. Wagner.
Chas. Penrose.
S. M. Swaab.
D. Robt. Yarnall.
Robt. H. Fernald.
W. P. Dallett.

STATISTICS.

Wm. P. Parker, *Ch'n.*
W. L. Plack.
W. H. Sanford.
A. W. Crawford.
C. B. Fairchild, Jr.

CIVIL ENGINEERING.

Benjamin Franklin, *Ch'n.*
John Meigs.
Norman L. Stamm.
J. A. Vogleson.
Walter F. Ballinger.
M. Ward Easby.
R. A. Prendergast.
A. R. Lindsey.
J. C. Wagner.

TRANSPORTATION.

E. B. Temple, *Ch'n.*
Samuel T. Wagner.
W. S. Twining.
R. H. Horton.
S. A. Sloan.
Henry H. Quimby.

POWER AND LIGHT.

Clayton W. Pike, *Ch'n.*
Benj. P. Foster.
A. C. Wood.
Wm. J. Serrill.

CENTRAL STATION SERVICE.

W. C. L. Eglin.

COMMUNICATION.

J. L. Kilpatrick,

REAL ESTATE LIAISON.

John Meigs.
D. E. Dallam.

ARCHITECTURAL LIAISON.

D. Knickerbocker Boyd.
John T. Windrim.

PUBLIC INFORMATION.

H. F. Sanville.

EXECUTIVE COMMITTEE.

John Price Jackson, *Ch'n.*
William P. Parker.
Benjamin Franklin.
E. B. Temple.
Clayton W. Pike.
W. C. L. Eglin.
J. L. Kilpatrick.
J. A. Steinmetz.
Joseph C. Wagner.
Chas. Penrose.
S. M. Swaab.
D. Robt. Yarnall.
Robt. H. Fernald.
W. P. Dallett.
John Meigs.
D. K. Boyd.

CORRELATION COMMITTEE.

William P. Parker, *Ch'n.*
Benjamin Franklin.
Clayton W. Pike.
J. L. Kilpatrick.
E. B. Temple.

SCOPE COMMITTEE.

William P. Parker, *Ch'n.*
Clayton W. Pike.
E. B. Temple.

APPENDIX B

REPORT OF CORRELATION COMMITTEE FINDINGS

January 21, 1922.

Sesqui-Centennial Committee,
Engineers' Club of Philadelphia,
Philadelphia, Pa.

To the Chairman:

The following is a condensed report on the selection of the Sesqui-Centennial site by your Correlation Committee.

We have taken the reports of the various subcommittees and combined them, giving the relative weights to the various items as authorized by instructions from the General Committee and in accordance with the following tables:

	Per Cent.	*Reported on by*
Procurability	13.0	Real Estate Board.
Aesthetics	12.0	American Institute of Architects.
Accessibility and Transportation	18.0	Transportation Committee, Engineers' Club.
Cost and Salvage	10.5	All committees, Engineers' Club.
Health (Water Supply, Sewerage, Topography)	9.0	Civil Engineering Committee, Engineers' Club.
Comfort	9.0	Civil Engineering Committee, Engineers' Club.
Housing and Feeding	9.0	Real Estate Board.
Size	4.5	Real Estate Board, American Institute of Architects, Engineers' Club.
Facilities for Exhibitors	4.5	Scope Committee, Engineers' Club.
Power and Light	3.5	Power and Light Committee, Engineers' Club.
Communication	2.0	Communication Committee, Engineers' Club.
Miscellaneous	5.0	All committees, Engineers' Club.
Total	100.0	

The result of our investigation places the various sites in three groups in the order of their desirability, viz.: Group No. 1, or Fairmount Park sites; Group No. 2, or Northern sites; and Group No. 3, or Southern sites.

GROUP NO. 1.

Group No. 1 includes three sites: 1—Fairmount Park-Parkway. 2—Upper Fairmount Park (former Centennial Site). 3—Lower Fairmount Park or Cret Plan (see Plate II).

The results of our investigation indicate that this group is first in the order of merit.

From the standpoint of procurability this group presents no difficulties, except in the case of the Original Cret Plan, which presents legal difficulties and delay in securing the property below Vine street on both banks of the Schuylkill.

The sites in this group are the most beautiful of all sites considered, the Upper Park Site being slightly less desirable in this respect, as it cannot offer such attractive settings as the Fairmount Park-Parkway Plan or the Original Cret Site, both of which can be developed on both sides of the river.

This group is the most accessible of all groups and should attract the largest attendance. There is a slight advantage, however, in the Fairmount Park-Parkway Site from the standpoint of transportation and accessibility, due to the fact that the Fair is substantially developed on both sides of the river. The Fairmount Park-Parkway Plan and the Original Cret Site have the advantage of the Parkway.

There is no cost in connection with acquiring the Fairmount Park-Parkway and the Upper Fairmount Park Sites, as they are entirely under Park ownership or control; while with the Lower Fairmount Park or Original Cret Site the lower banks of the Schuylkill are on private property, the cost of which would be very heavy. Leaving out of consideration for the moment the banks of the Schuylkill below Vine street in the Original Cret Site, there are no expenses in connection with the preliminary fill and no serious foundation problems, such as exist in Group No. 3. However, referring to the banks of the Schuylkill below Vine street in the Original Cret Plan there are some very difficult, intricate and expensive engineering problems involved before building construction can begin, such as elimination of sewage, expense in covering the tracks on the east side, heavy river wall construction, relocation of tracks on the west side, and costly foundation construction.

The salvage in permanent structures in all three of these sites is the highest of all the sites considered, being greater particularly in the two sites which include a portion of the Parkway.

In the question of health and comfort, these sites are equal to Group No. 2 and superior to Group No. 3, except that portion

of the Original Cret Site low-lying along the banks of the Schuylkill river.

The housing and feeding problems for this group present fewer difficulties than is the case with either of the other groups.

On the question of size and ability to expand, the Fairmount Park-Parkway Site and the Upper Fairmount Park site are ample. This is not the case with the Original Cret Plan, which is not of sufficient size to develop an exposition of its probable extent and scope, or to handle satisfactorily the crowds which may be expected.

From the standpoint of power, lighting and communication, this group of sites ranks first, being less costly than in any other group, and in this connection the Fairmount Park-Parkway and the Original Cret Plan are comparatively superior to the Upper Fairmount Park Plan.

This group offers superior opportunities for visiting historical places, and the City retail district; and placing the Fair at one of these sites will doubtless hasten the development of the Parkway and greatly increase present and future tourist traffic.

Of this group of sites the Fairmount Park-Parkway Plan presents the greatest advantages, followed by the Upper Fairmount Park Site and the Original Cret Plan in the order named.

It might be thought that there would be possible injury to the appearance of the Park, due to the selection of a site within it, although a careful topographical survey will reduce this possibility to a minimum and the ultimate appearance of the Park will be improved rather than injured.

GROUP NO. 2.

Group No. 2 includes the following sites: Pennypack, Roxborough, Tacony and Juniata Park, Lower Roosevelt Boulevard, Upper Roosevelt Boulevard. (Plate II.)

This group is second in order of merit.

These sites are all procurable.

While the country is rolling and naturally attractive, and in this respect better than the sites in Group No. 3, they are considerably inferior to Group No. 1, particularly to the Fairmount Park-Parkway Plan and the Original Cret Site, which are balanced along both sides of the Schuylkill.

The sites in this group are less accessible and the transportation difficulties are greater than in Group No. 1.

As to cost, these sites are all unimproved properties and the amount of damage by destruction of existing buildings will be small. There will be required but very little preliminary filling and there are no serious difficulties as to foundations, such as occur in Group No. 3 and in the Original Cret Site of Group No. 1.

With the exception of Juniata and Tacony Park, from the standpoint of health and public comfort these sites are equal to any.

In regard to housing and feeding, this group does not provide facilities equal to those in Group No. 1.

As to size and ability to expand, the sites are all satisfactory

Of this Group No. 2, Pennypack Park and Roxborough present the greatest advantages.

GROUP NO. 3.

Group No. 3 includes the following sites: Alternate League Island Park, Hog Island, League Island Park, Fortieth Ward and Cannonball Farm. (Plate II.)

This group is third in order of merit.

All of these sites are readily procurable, with the possible exception of the original League Island Park Site, which latter interferes with the Philadelphia agreement between the City and the railroads.

Three of the sites in question have an advantage because of being on the Delaware river. However, in general, all the five sites of this group are low, flat tracts, and while an exposition could be made architecturally attractive on any of them it would be at a cost very much greater than is the case with the sites in either Group No. 1 or 2.

The impression on visitors in approaching any one of these sites would be much less favorable than is the case with the sites in the other two groups.

From the standpoint of accessibility and transportation this group is superior to Group No. 2, and for some of the sites is equal to Group No. 1.

In considering the cost in connection with these sites Hog Island (United States Shipping Board) has some advantages, due to existing development. However, all the sites of this group require very expensive preliminary fill as well as special pile foundations; these two items alone for any one of these sites require an expenditure of millions of dollars.

These sites are least advantageous from the standpoint of

health and comfort because of the proximity of low-lying land, resulting in a greater humidity and heat and the annoyance of mosquitoes during the summer months when the Exposition will be held.

This group provides facilities for housing and feeding better perhaps than Group No. 2, but not equal to Group No. 1.

From the standpoint of size and ability to expand these sites are all satisfactory.

Of this group of sites Alternate League Island Park and Hog Island present the greatest advantages.

REMARKS.

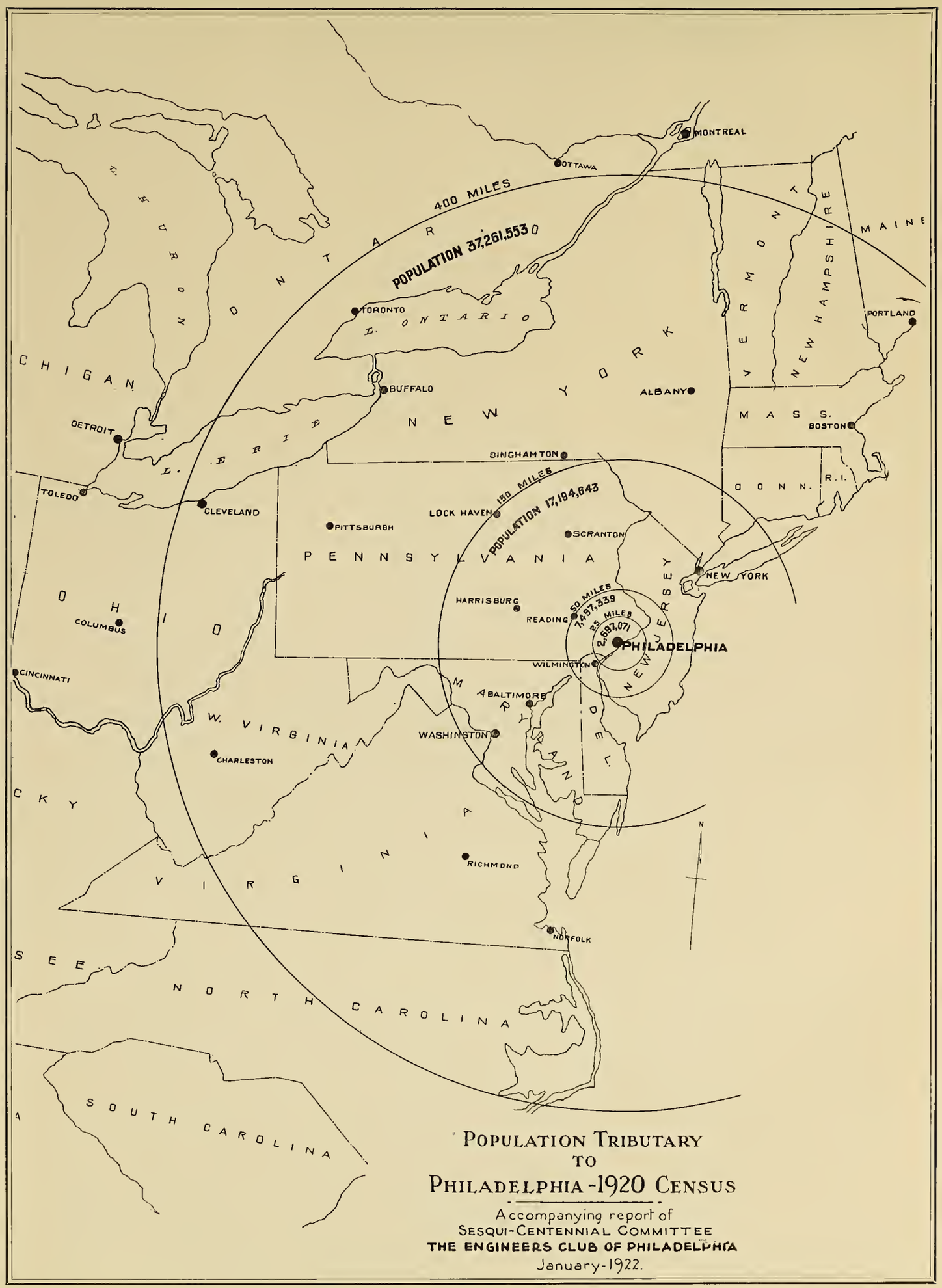
It is suggested that if in the judgment of the Sesqui-Centennial authorities an outdoor agricultural exhibit or a naval and marine exhibit is considered advisable these exhibits may be given at locations separate from the main Exposition.

CONCLUSION.

This condensed report is, of course, general in nature, and we would refer to the reports of the subcommittee on Statistics, Civil Engineering, Transportation, Power and Light, Communication, Scope, etc., for additional information and details not contained herein. We would also recommend a careful study of the illustrations and tables.

Respectfully submitted,

BENJAMIN FRANKLIN,
E. B. TEMPLE,
CLAYTON W. PIKE,
J. L. KILPATRICK,
WILLIAM P. PARKER, *Chairman,*
Correlation Committee.



Population Tributary to Philadelphia - 1920 Census

Accompanying report of
Sesqui-Centennial Committee
The Engineers Club of Philadelphia
January-1922.

PLATE III

APPENDIX C

REPORTS OF THE COMMITTEE ON STATISTICS AND SCOPE

TABULATIONS AND FAIR REQUIREMENTS

Sesqui-Centennial Committee,
Engineers' Club of Philadelphia,
Philadelphia, Pa.

To the Chairman:

Your Subcommittee on Statistics was assigned the following program of work:

> "Secure and tabulate comparative statistics concerning previous world expositions and such other data as may be determined upon at the organization meeting.
>
> "Prepare such maps, charts, etc., as may be required, including the master map of the City, which is to be located in the main lounging room of the Clubhouse and to show clearly the areas considered as available for exposition purposes, indicating the City-owned properties and data submitted by the Real Estate Board."

Acting under these instructions we beg leave to submit the following:

PREVIOUS WORLD'S EXPOSITIONS.

STATISTICS ON 16 AMERICAN AND FOREIGN EXPOSITIONS.

Through the courtesy of both the Philadelphia Chapter, American Institute of Architects, and the Real Estate Board, and from information that we were able to obtain from public libraries and other sources we submit the attached table, giving general information covering twelve American and four foreign world's expositions. The information covering such points as the year held; number of days open; paid admissions; average daily paid attendance; total attendance, free and paid; greatest day and ratios for these items; also percentage daily paid attendance vs. population in terms of local population, and population within 25-mile radius and 50-mile radius; areas in acres of grounds and buildings; gross expenditure, grounds and buildings; gross outlay; admission and concession averages in cents; and subscriptions and receipts.

A careful study of these tables will undoubtedly be productive of good results (see Plate IV).

MAPS, CHARTS AND SUGGESTED SITES.

In accordance with your instructions the Committee has made use of the master map and also additional maps and charts; all have been placed on the walls in the Engineers' Club lobby. Our source of information as to the location of available sites has been primarily the Sesqui-Centennial Committee of the Real Estate Board; and afterwards, as a result of letters written to the several parties interested in various sites, general information on all sites. The master map has been considered the neutral map, on which has been placed in proper scale all the various sites submitted, with information as to distances, transportation, geographical features, etc.

Space has been given on the lobby walls for any exhibits within reason which any of the parties interested in the different sites cared to submit. Also these various parties have supplied your Committee very freely with information and details as to the advantages and disadvantages of these various sites.

A reproduction of the large master map on the wall of the Engineers' Club is shown in Plate II.

The following reproductions of plans of some of the sites which have been displayed on the walls of the Engineers' Club and which were submitted by those interested in these particular sites, are shown on the plates noted:

Lower Fairmount Park, or Cret Plan (Plate V).

League Island Park Plan (Plate VIII).

Roxborough Plan (Plate VII).

Upper Fairmount Park—former Centennial (Plate VI).

Hog Island Plan—United States Shipping Board (Plate X).

Pennypack Park Plan (Plate IX).

A reproduction of a plan of Philadelphia and the surrounding territory, showing population within a 25-mile radius, 50-mile radius, 150-mile radius and 400-mile radius (Plate III).

The following sites are noted on the master map; the distances being measured to the center of the sites, not to the nearest entrance.

No. 1—Pennypack Park Site No. 1 (covering park only). Indorsed by Holmesburg Improvement Association. Approximately 2,000 acres, all City-owned. Ten miles from City Hall.

No. 2—Pennypack Park Site No. 2. Indorsed by Frankford Board of Trade. 7,000 acres; 2,000 City-owned, 5,000 privately-owned. Ten miles from City Hall.

No. 3—Pennypack Park Site No. 3. Indorsed by Tacony Manufacturer's Association. 1,000 acres; 500 City, 500 privately-owned. Ten miles from City Hall.

No. 4—Upper Roosevelt Boulevard (west side of boulevard). Indorsed by Albright & Mebus. 1,000 acres, all privately owned. Eight miles from City Hall.

No. 5—Lower Roosevelt Boulevard (west side of boulevard). 700 acres, part privately and part City-owned. Six miles from City Hall.

No. 6—Juniata and Tacony Park Plan. 600 acres, part City and part privately-owned. Five miles from City Hall.

No. 7—Roxborough Plan. Indorsed by DeArmond, Ashmeed & Bickley. 2,000 acres, all privately-owned. Nine miles from City Hall.

No. 8—Upper Fairmount Park (former Centennial Site). Indorsed by Albright & Mebus. 750 acres, all City-owned. Four miles from City Hall.

No. 9—Lower Fairmount Park or Cret Plan. Indorsed by Fairmount Park Art Association. 214 acres, part City, part railroad and part privately-owned. Available adjacent property, 600 acres. Two miles from City Hall.

No. 10—League Island Park Plan. Indorsed by Joseph M. Huston. 963 acres, being 300 City, 559 railroad and 104 private. Available adjacent acreage, 659. Four miles from City Hall.

No. 11—Alternate League Island Park Plan (immediately north of League Island Park Plan). 800 acres, all private. Three miles from City Hall.

No. 12—40th Ward or Cannonball Farm Plan. 1,800 acres, part privately and part City-owned. Six miles from City Hall.

No. 13—40th Ward Plan (immediately north of Cannonball Farm). Offered through the Real Estate Board. 1,000 acres, all privately-owned. Five miles from City Hall.

No. 14—United State Shipping Board (Hog Island) Plan. Indorsed by W. L. Plack, C. F. Neff and Victor Wierman. 846 acres, owned by Federal Government. Available adjacent property 1,000 acres. Seven miles from City Hall.

There is no significance in the numbers or the order given above, the sites being merely followed in a general way from north to south.

A visual scale of acreage has been placed on the master map, which will give direct comparison in an approximate way of the areas of the various sites.

PROBABLE ATTENDANCE.

The attendance at the Sesqui-Centennial can undoubtedly be fairly well approximated by comparison with previous expositions, particularly in connection with the population as well as the different radii about the centers of the expositions, as these populations seem to bear a direct ratio to the attendance at the expositions.

For this comparison, the following information will be of use:

Philadelphia proper	1,800,000
District radius, 25 miles from City Hall	2,500,000
District radius, 50 miles from City Hall	7,500,000

(See reproduction following page 18)

Judging by the record of past expositions, the average daily attendance bears a direct ratio to the local population. This general average is approximately 10 per cent. Assuming that the population of Philadelphia proper in 1926 will undoubtedly reach 2,000,000 people, this would indicate an average daily attendance of 200,000, probably varying between a minimum of 90,000 to 100,000 and a maximum of 400,000. Judging by

past history and future hopes the Exposition will probably last 200 days, so that this would make a total paid attendance of 40,000,000 people. This figure has a direct bearing on the consideration of transportation, acreage, cost and other matters.

In connection with the question of attendance, we might state that the Sesqui-Centennial Site, to wit, Philadelphia, is the center of a much denser population than any exposition that has ever been held before in America. In addition to the above 2,000,000 population in the City proper there is at present in a radius of 400 miles, or one night's ride to Philadelphia, a population of 37,300,000, or practically one-third of the population of the entire United States.

AREA OF PROPOSED SITE.

A careful study of the table of previous expositions will show that the areas of the different expositions bear no direct relation either to the cost or the attendance, but that the relation between open area and area occupied—or in other words, the extent to which the Exposition is intensively developed—is really the determining feature.

As a matter of information, quoting the report of the Scope Committee, they are of the opinion that the Exposition should have a total acreage of from 600 to 800 acres, based on the following assumptions and having particular reference to two of the most recent expositions, to wit: the 1900 Fair in Paris and the San Francisco Exposition in 1915, reports of which are attached.

That the main Exposition buildings will probably occupy 100 acres of ground. That the incidental buildings adjacent and necessary will occupy 50 acres of ground; and that the 150 acres of buildings will require a minimum of 150 acres additional for proper setting, or a total of 300 acres; and that, in addition to this, from 300 to 500 acres more—covering such other purposes as stadium and athletic events, outdoor agriculture, etc., or a grand total of 600 to 800 acres.

The facility for parking automobiles is an important consideration and tracts of ground totalling from 100 to 150 acres would seem to be necessary adjacent to the Exposition. Much of the parking will likely be distributed through the Exposition grounds and at the several entrances.

PROBABLE COST.

On the question of cost, past experience in connection with the table of statistics furnished (Plate IV) will give a very good estimate of the cost of this Exposition, provided that no new features are added or contemplated. However, we all know that the Sesqui-Centennial will have many of the old features enlarged and many features which were in no way covered by previous expositions. These require consideration, not only as to the cost but as to area, transportation and other features.

All we can do at this time is to refer in a general way to the cost of other expositions, considering the choice of site from the standpoint only as to whether the cost is prohibitive in each individual case, being guided by such facts as the following:

Chicago—Total cost of grounds and buildings, $18,678,000; gross outlay, $27,292,000.

St. Louis—Total cost of grounds and buildings, $16,704,000; gross outlay, $26,564,000.

San Francisco—Total cost of grounds and buildings, $14,847,000; gross outlay, $25,865,000.

Paris, 1900—Gross outlay, $20,609,000.

In considering the above figures of cost in connection with the question of site, two things must be borne in mind: First, the difference in the market value of labor, material and real estate then and now; and second, that the net cost bears a very decided relation to the gross cost. In other words, while the gross cost must be raised, if it can be shown that there is a good salvage value or that the net cost is less than the gross, it will be much easier to raise the gross.

We understand from the newspapers that City Council will probably pass an appropriation for $5,000,000, possibly followed by a similar amount from the State and more from the Nation and people. (See Plate IV, following page 18, and tables on page 16.)

Respectfully submitted,

W. L. PLACK,
WM. H. SANFORD,
ANDREW WRIGHT CRAWFORD,
C. B. FAIRCHILD, JR.,
WM. P. PARKER, *Chairman,*
Statistical Committee.

EXHIBIT, DATA REGARDING APPROPRIATIONS, EXPENSES, ATTENDANCE, ETC., OF PAST WORLD'S FAIRS.

PHILADELPHIA-INTERNATIONAL CENTENNIAL EXPOSITION

May 10, 1876.

National Appropriation	$2,183,184.59
City Appropriation	1,500,000.00
State Appropriation	1,500,000.00
Private Subscription	2,300,000.00
Attendance (total)	9,910,966
Attendance (paid)	8,004,274
Cost	8,500,000.00

CHICAGO—WORLD'S COLUMBIAN EXPOSITION.

May 1 to October 30, 1893.

National Appropriation	$5,840,329.64
State Appropriation	800,000.00
City Appropriation	5,000,000.00
Capital Stock	5,000,000.00
Miscellaneous Contributions	3,000,000.00
Attendance (total)	27,539,041
Attendance (paid)	21,480,141

ST. LOUIS, MO.—LOUISIANA PURCHASE EXPOSITION.

April 30 to December 1, 1904.

National Appropriation	$11,122,500.00
State Appropriation	1,000,000.00
City Appropriation	5,000,000.00
St. Louis Citizens' Subscriptions	5,000,000.00
Attendance (total)	19,694,855
Attendance (paid)	12,804,616

PAN-PACIFIC INTERNATIONAL EXPOSITION.

Total Cost of Plant (grounds, buildings)		$14,847,607
(a) Eleven Palaces, 64 acres, 2,795,065 square feet, @ $1.57..		4,382,559
(b) California Building, 232,368 square feet, and Motor Transportation Building, extra.		
Per cent. aisles, columns, convenience space, 33 1/3.		
Site		1,000,000
Preparation of Site, Sewers, etc.		2,000,000
Principal Buildings, (a) and (b) above, plus others		5,638,000
Mechanical and Electrical	$474,000	
Fire Protection—Sprinkler	129,000	
F. A. System, Police Alarm	58,000	
		661,000
Decoration		$1,800,000
Gardens		600,000
Forces up to opening—600 days:		
Working, Exposition—men-days	468,353	
Administrative and Professional, Exposition	182,194	
Contractors and Exhibitors	1,457,096	
		2,107,643
Maximum force—men	15,026	

Eight gates, 84 turnstiles. Zone, ⅝ mile. Space for exhibits free. Selling privilege extra.

Revenue:	
Admissions, all kinds	$4,715,000
Admissions, Maximum Day (closing)	459,000
Admissions, San Francisco Day	348,000
Admissions, Opening Day	255,000
Admissions, Labor Day	144,000
Admissions, July 4th	190,000
Concessions:	
Total	$7,497,000
Exposition received 21 per cent. average (including exhibitors' sales—$126,884)	1,830,000

Condensed General Statement of Receipts and Disbursements to December 31, 1919.*

Receipts:

Public Subscriptions	$5,716,320.00
State of California Subscriptions	4,941,556.26
Municipal Aid, City and County of San Francisco	5,000,000 00
Mortgage Note Loan	1,112,500.00
Admission Revenue	4,983,610.60
Concession Revenue	1,599,360.27
Miscellaneous Income and Expense Abatements	2,884,257.17
Salvage	940,460 84
Total Receipts	$27,178,065.14

Disbursements:

Exposition Development and Construction	$18,452,616.72
Exposition Operation and Maintenance	4,979,307.11
Mortgage Note Loan	1,112,500.00
Closure and Site Restoration Expense	1,321,490.55
Total Disbursements	$25,865,914.38

Balances:

Pre-Exposition Deficit	$1,381,227.43
Exposition Operating Surplus	2,865,351.68
Net Closing Cost over Salvage	171,973.49
Final Surplus	1,312,150.76

*The data given below were furnished by the Congressional Library at Washington, which is a different source from that given above.

Miscellaneous:

Total Attendance	18,413,399
Average Daily Attendance	62,000
Number of Exhibitors	80,000
Value of Exhibits	$350,000,000.00
Operating Surplus of Exposition Period	2,571,807.79
Estimated Net Profit on Closing	1,195,169.89
Estimated Final New Profit	1,040,000.00

PARIS EXPOSITION—1900.

Superficial area	279 acres*
Building area	111½ acres, 40 per cent. of area
French Section (buildings)	2,891,000 square feet, 60 per cent.
Foreign Section (buildings)	1,829,880 square feet, 40 per cent.
Total	4,520,880 square feet
Receipts	$22,800,000
Expenses	$23,300,000
Funds granted:	
By French Government (at 5 francs per dollar)	$4,000,000
City of Paris	4,000,000
Bond Issue	12,000,000
Bonds of 20 francs each issued.	
Receipts from Restaurant and Amusement Permits	$1,772,880
Total Admissions	47,000,000

**Note*—The above acreage does not include that of the Parc de Vincennes (usually cited), as this was far removed from the exposition proper, but does include the Trocadero.

FEDERAL APPROPRIATIONS FOR EXPOSITIONS

1876.	Philadelphia, Pa.	$2,183,184.50
1880.	Yorktown, Va.	172,328.92
1881.	Louisville, Ky.	10,000.00
1884.	New Orleans, La.	1,650,000.00
1888.	Cincinnati, Ohio	157,750.00
1893.	Chicago, Ills.	5,840,329.00
1895.	Atlanta, Ga.	200,000.00
1897.	Nashville, Tenn.	130,000.00
1898.	Omaha, Neb.	240,000.00
1899.	Buffalo, N. Y.	1,015,000.00
1901.	Charleston, S. C.	250,000.00
1904.	St. Louis, Mo.	11,122,500.00
1905.	Portland, Oregon	485,000.00
1907.	Jamestown, Va.	2,650,000.00
1909.	Seattle, Wash.	600,000.00
1915.	San Francisco, Cal.	1,174,000.00

(Information gathered by the Congressional Library for the Sesqui-Centennial Committee of the Engineers' Club.)

REPORT OF THE SCOPE COMMITTEE

January 14, 1922.

Sesqui-Centennial Committee,
Engineers' Club of Philadelphia,
Philadelphia, Pa.

To the Chairman:

Your Special Committee on Scope, to which was referred the matter of size, scope and type desirable for the Sesqui-Centennial Exposition, have considered these matters to the best of their ability and beg to report their conclusions as follows:

That this Exposition should be international in character and as complete as possible, covering in a general way every phase of what the world has done in the last fifty years, but that competent and courageous judges should be secured to pass on the different exhibits so as to avoid mediocrity and duplication. In other words, the Fair should be open to every field of human endeavor but should contain only those things which have passed this jury of selection.

The following is a general tentative list of buildings which will probably be needed:

1—Manufactures and Liberal Arts.
2—Machinery, including Electricity.
3—Mines, Metallurgy and Chemistry.
4—Transportation.
5—Agriculture.
6—Fisheries.
7—Food Products.
8—Music, including Auditorium.
9—Horticulture.
10—Art Galleries.
11—Education.
12—Anthropology.
13—United States Government Building.
14—Administration Building.
15—Pennsylvania Building.
16—State Buildings.
17—Foreign Buildings.
18—Building Arts.
19—Stadium and Drill Ground.
20—Necessary Buildings for Amusements.

In regard to size it would seem that the main group of buildings would require 100 acres of space and that other buildings, incidental but necessary to this group, would require 50 acres of space, and that this 150 acres of buildings would require as a minimum space for proper setting 150 acres more, or a total of 300 acres, and that from 300 to 500 acres additional would be required for other purposes, making a total requirement for the Exposition of from 600 to 800 acres; and also it is our opinion that this site of 600 to 800 acres should preferably be all in one tract. The 300 acres above mentioned and as much more as possible must necessarily be in one tract, with the balance of the acreage located as closely adjacent as possible.

Respectfully submitted,

(Signed) CLAYTON W. PIKE,
E. B. TEMPLE,
WILLIAM P. PARKER, *Chairman.*
Scope Committee.

REQUIREMENTS FOR THE SITE

The following presentation of requirements of a site are drawn from a special report to the Committee made by Major Clayton W. Pike.

Procurability, promptness of.

Aesthetics:

(a) Natural beauty of site:
  1. View from.
  2. Picturesqueness—water in landscape.
  3. View towards, at night.

(b) Appearance along transportation routes.

(c) Appearance of immediate surroundings.

Accessibility (which affects attendance).

Transportation:

By foot, rail, street railway, bus, jitney, automobile, water and air from different directions.
Garaging and parking of vehicles.
Air fields, take off and landing field.
Hydroplane, take off and landing place.

Cost and Salvage:

(a) First cost:
  1. Land, buildings and equipment.
  2. Operation and maintenance.

(b) Income from probable admissions.

(c) Salvage:
  1. Permanent buildings, National, State, City, institutional.
  2. Permanent improvements, parks, squares, monuments, bridges, etc.
  3. Other permanent improvements.

Health:

(a) Water:
  1. For drinking.
  2. For other purposes.

(b) Sewage and drainage.

Comfort:

(a) Freedom from pests—mosquitoes.
(b) Freedom from excessive heat.
(c) Freedom from excessive dampness.
(d) Freedom from smells.
(e) Freedom from smoke.

Housing and Feeding:

(a) Hotels.
(b) Restaurants.
(c) Apartments.
(d) Boarding houses.
(e) Lodgings.
(f) Garaging and repairs.
(g) Feeding.

Size:

Ability to expand beyond first conception if interest warrants.

Facilities for all Varieties of Exhibits:

(a) Naval and marine:
  1. Deep sea waterfront.

(b) Agricultural:
  1. Large area.
  2. Fertility of soil.

(c) Military:
  1. Large area, 30 acres:
    For troops.
    For ranges.
    For maneuvers.
  2. Obstacles—Natural or artificial, as hills, ditches, trees.

(d) Dairy, including milk treatment, butter, cheese and ice cream plant:
  1. Area, 10 acres.
  2. Not in very midst of great crowds.
  3. Facilities for manure disposal.

(e) Ethnology—Tribes living in natural manner:
  1. Large area, say 50 acres.
  2. Shaded.
  3. Diversified topography.

Power and Light:

(a) Electric:
  1. Central station.
  2. Exposition plant:
    Water for boilers and condensing.
    Fuel—supply and storage.
    Ash, disposal of.

(b) Steam—for heating, exhibits, etc.

(c) Gas—for heating, exhibits, decorative lighting, safety lighting.

AMERICAN AND FOREIGN EXPOSITION STATISTICS

	EXPOSITIONS			ATTENDANCES AND THEIR RATIOS												AREAS		GROSS EXPENDITURES				ADMISSION AND CONCESSION			SUBSCRIPTIONS AND RECEIPTS	
	COL.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
												PERCENTAGE DAILY PAID ATTENDANCE VS. POPULATION												AVERAGES IN CENTS				
	LINE	LOCATION	YEAR	NUMBER OF DAYS OPEN	TOTAL NUMBER PAID ADMISSIONS	AVERAGE DAILY PAID ATTENDANCE	RATIO-LOCAL POPUL. TO TOTAL PAID = COL. 4 ÷ COL. 11	TOTAL ATTENDANCE FREE AND PAID	GREATEST DAY FREE AND PAID	AVERAGE OF TOTAL ATTENDANCE FREE AND PAID	RATIO: GREATEST DAY TO AVERAGE COL. 8 ÷ COL. 9	LOCAL POPULATION ESTIMATED AT DATE OF EXPOSITION	PERCENTAGE = COL. 8 ÷ COL. 11	POPULATION 25 MILE RADIUS	PERCENTAGE COL. 5 ÷ COL. 13	POPULATION 50 MILE RADIUS	PERCENTAGE COL. 5 ÷ COL. 15	GROUNDS IN ACRES	BUILDINGS IN ACRES	GROUNDS AND BUILDINGS COST	GROSS OUTLAY EXCLUDING REPAYMENT AND DIVIDENDS	RATIO: BUILDINGS AND GROUNDS TO GROSS OUTLAY COL. 19 ÷ COL. 20	GROSS OUTLAY PER PAID ADMISSION	PRICE PER PAID ADMISSION	CONCESSION PER PAID ADMISSION	TOTAL PER PAID ADMISSION AND CONCESSION	EXPOSITION FUNDS SUBSCRIBED EXCLUDING REPAYMENT AND DIVIDENDS	TOTAL RECEIPTS FROM ADMISSIONS COMPUTED
AMERICAN	A	PHILADELPHIA	1876	159	8,004,000	50,000	10.3					775,000	6.45					285	*70	$6,165,000	$8,980,000	68.6	$1.12	47½	05½	53	$4,817,000	$3,801,900.00
	B	CHICAGO	1893	179	21,480,000	120,000	16.8	27,529,400	716,881	173,140	4.14	1,280,000	9.37	1,400,000	8.50	1,800,000	6.70	686	*188	18,678,000	27,292,000	68.5	1.27	48	16	64	13,200,000	10,310,400.00
	C	MIDWINTER	1894	160	1,434,000	9,000	4.5	2,338,499		14,615		317,000	2.84	445,000	2.01	566,000	1.59	160	* 6	607,000	1,134,000	53.5	.79	37	15	52	371,000	530,580.00
	D	ATLANTA *	1895	90	818,000	9,000	10.5			13,030		78,000	11.51					189	10	443,000	861,000	51.5	1.17	45	15	60	297,000	368,100.00
	E	NASHVILLE *	1897	155	1,274,000	8,000	15.9	1,786,714		11,527		80,000	10.00					200	12	528,000	1,101,000	47.8	.86	34	10	44	474,000	433,160.00
	F	OMAHA	1898	153	1,778,000	11,600	17.8			17,082		100,000	11.06					184	10	1,104,000	1,572,000	70.3	.88	45	16	61	476,000	800,400.00
	G	BUFFALO *	1901	184	5,307,000	29,000	15.1	8,520,048		46,304		357,000	7.90	507,000	5.77	700,000	2.70	*350	15	4,659,000	*7,197,000	65.2	1.35	45	25	70	3,115,000	2,388,150.00
	H	ST. LOUIS *	1904	187	12,804,000	68,000	20.7	19,694,855	404,450	107,015	3.77	620,000	10.97	835,000	8.14	1,086,000	6.29	1,240	*128	16,704,000	76,564,000	63.0	2.07	49	24	73	14,557,000	7,274,860.00
	J	PORTLAND	1905	137	1,559,000	11,600	12.6					126,000	9.20					*406			1,439,000		.90			70	405,000	
	K	JAMESTOWN *	1907	219	1,481,000	6,800	21.4					69,000	9.80					350			*3,700,164		2.50	44	15	59	2,115,600	651,640.00
	L	SEATTLE	1909	139	2,766,000	20,000	12.5	3,740,551		26,910		221,000	9.05	260,000	7.70	365,000	5.48	255		*2,202,000	3,128,000		1.13	39½	11	50	*1,677,000	1,092,570.00
	L'	SAN FRANCISCO*	1915	288	13,127,103	45,580						500,000						635	330	14,847,607	18,452,617							
FOREIGN	M	PARIS	1889	185	25,398,000	137,000												228	62½	5,826,000	8,300,000		.32				5,000,000	
	N	PARIS	1900	210	37,287,000	177,000												336			20,609,000		.54				8,000,000	
	O	BRUSSELS	1910	199	5,500,000	27,600												235										
	P	TURIN	1911															247	64								1,000,000	
	R	TOTAL AVERAGES					14.4				3.95		8.92		8.04		5.94					61.0	1.14					
	S	AVERAGES (OMITTING EXPOSITIONS NOTED)					19.1						9.76		7.52		5.54					67.1	1.68					

* Referring to note under respective Line Letter and Column Number

LINE	COL.	NOTES
A	1	Closed nights and Sundays.
A	18	57½ Acres main and 12½ Acres secondary
B	18	150 " " " 38 " "
C	18	5 main buildings. 6 Acres
D	1	Closed Sundays
E	1	" "
G	1	Director General's report estimates loss occassioned by President Mc Kinley's tragic death, in attendance, 2,521,000 people. In revenue from admissions $1,132,000 and concessions $457,000, total $1,589,000.
G	17	150 Acres main and 200 Acres secondary.
G	20	Approximated
H	1	Closed Sundays
H	18	Exhibit Bldgs. 109 Acres. Total under Roof 128 Acres
J	17	120 Acres land - 286 Acres water
K	1	Partially closed Sundays.
K	20	Approximated
L	19	Including maintenance.
L	26	" $1,000,000 from State
L'	1	Data not included in averages
S	6	Omitting A, C, D, E, G, J and L.
S	12	" C and G.
S	14	" A, C, D, E, F, J and K.
S	16	" " " " " " " "
S	21	" C, D and E.
S	22	Omitting A, C, D, E, G, J and L.

Committee on Statistics

SESQUI-CENTENNIAL COMMITTEE

ENGINEERS CLUB OF PHILADELPHIA

December 1921

PLATE IV

(d) Water power—for exhibits.
(e) Distribution:
1. Freedom from rock.
2. Freedom from water in manholes and around steampipes.

Communication:
(a) Telephone.
(b) Telegraph.
(c) Wireless.
(d) Mail.

Miscellaneous:
Increase in business of merchants during exposition.
Increase in taxable property of the City after the Exposition.
Effect on the City's future planning and development:
It is conceivable that some sites might have a specially good effect and others a deleterious effect.
Effect of permanent improvements upon the minds of Philadelphians.
Effect of permanent improvements upon future tourist traffic to Philadelphia, etc.

COMMENTS ON REQUIREMENTS.

1. *Procurability promptly.*

First importance is given to this requirement because the site which cannot be procured with reasonable promptness, or whose procurement is liable to long delays through litigation or split ownership, while having other qualities to a marked degree, would not be a safe site to select for the Exposition.

2. *Accessibility.*

By foot and other transportation largely determines the number of admissions. Not only does the increase in number of admissions mean a financial gain, but it also enhances the beneficial effect of the Fair.

3. *Aesthetics.*

The attractiveness of the Exposition, its surroundings and the routes of transportation exercises an enormous influence upon the attendance, the mental effect and the reputation of Philadelphia. Its importance is therefore equivalent to that of accessibility.

4. *Transportation.*

Inadequate transportation curtails the number of admissions and promotes a feeling of dissatisfaction on the part of visitors, whether from nearby or remote points. I therefore consider that transportation is in a sense as important as accessibility and æsthetics; but even if it were found to be inadequate at the opening, this can be corrected with great promptness by more auto bus facilities and it might be possible to somewhat increase the facilities by railroad and street railway before the maximum crowds occurred; whereas the æsthetic conditions and accessibility on foot cannot be changed at all. I therefore rate transportation as slightly less important than accessibility and aesthetics.

5. *Cost.*

There are two costs to be considered: First, the net investment cost, viz.—first gross cost less the value of salvage, including under the heading of salvage the money value of permanent improvements and possibly the greater intangible permanent value of these same improvements (such as permanent buildings, extensions to park system, monuments, etc.) to the City of Philadelphia. The other item of cost to be considered is the cost of operation and maintenance of the Exposition grounds and buildings, from beginning to end of the Exposition. Both these costs are of course of considerable importance and the former affects the amount of money that must be raised to get the fair into operation.

6. *Public Health.*

Good drinking water in sufficient quantity and certainty, plus satisfactory sewage disposal, are vital necessities and one might at first be tempted to assign a figure of 100 (or highest importance) to this, but by a sufficient expenditure of money they can be secured probably at all sites under consideration and the differences in quality and cost as between the sites will not be such a large percentage of the total cost of the Exposition as to warrant considering this matter of as great importance as those which have been previously taken up.

7. *Public Comfort.*

Reasonable freedom from pests, such as mosquitoes, excessive moisture, smells and smoke is also a requisite to the success of any exposition, but from reasoning similar to that in the case of public health it is considered of about equal importance.

8. *Housing and Feeding.*

The provision of food and shelter, not only for those attending the Fair, but for those engaged in its construction, operation and maintenance are very important matters and from this standpoint the different sites will vary widely. However, the problem can be satisfactorily solved for any site by the necessary expenditure of money and need not be rated of as much importance as earlier items.

9. *Size.*

Any site under consideration must of course have a certain acreage in order to have a worthy Exposition. Previous expositions have varied enormously in their total acreage—viz. from 228 in the Paris Exposition of 1889; 285 in the Centennial; 686, Chicago; and 1240, St. Louis. They have also varied greatly in the acreage of buildings under roof—from 62 in the Paris Exposition of 1889, to 330 at San Francisco. These variations are due largely to fundamental differences in the conception of a fair. The idea in some expositions has been excellence rather than size. The predominant idea in some of the American expositions appears to have been the attempt to surpass other expositions in size. There is no question but that the St. Louis Exposition was so stretched out as to be physically tiresome. The committees ought not to consider any site which is less than a minimum such as seems proper to them; but having adopted that minimum as a working basis, it would be entirely proper to give some weight to the feasibility in the various sites of readily adding to the minimum size some additional acreage in case of expanding plans for the Fair.

or increased interest, developed beyond what was first expected, should make it desirable to expand the exposition. I have, therefore, under the heading "Size," considered this ability to expand, not necessarily by the use of ground forming a geometrical enlargement, but of ground which is so near that it can be connected with the main body of ground by suitable roadways or bridges. To illustrate: No exposition site should be considered which would not permit considerable in the way of aviation. A space for this, which might be 60 or 100 acres, need not all of it be closely connected to the main body of ground, but only that portion which would serve as an exhibit of aeroplanes or hydroplanes at rest. The portion which would serve as an aviation field and place for take off and arrival could be, as are the landing fields in various cities, at some little distance. It is conceivable, however, that between now and 1926 a size which might be considered suitable today for all the purposes of aviation ought to be considerably larger to correspond with some remarkable development in the art; so that it is advantageous that a site of the size determined upon now can be enlarged if desirable.

10. Facilities for Exhibits.

Many special exhibits of interest to some classes will come to mind; and it is improbable that any one site will offer all the desirable features for all of these exhibits. However, consideration and rating should be given in the various sites for the ability to meet many of the requirements for such exhibits as occur to us. For example: it has been urged that a large exhibit of warships and perhaps merchant shipping would be an attractive feature in connection with several of the sites proposed.

A spectacular and probably widely interesting exhibit could be made of army ordnance, such as a great gun on a railway mount, an 8-inch Howitzer on a caterpillar mount, which surmounts considerable obstacles, goes into and out of quite considerable ditches and which I have seen overturn a 9-inch tree; also a working exhibit of the tanks which played such a vital part in the late war.

Ethnological exhibits of curious people have been found of great interest, etc., etc.

11. Power and Light.

The supply of power and the problem of adequate and artistic illumination are two of the large problems connected with any exposition, and the lighting of San Francisco made an impression more striking and more enduring probably than any other thing which visitors saw. However, as between different sites the variation in difficulty of accomplishing the supply of power and lighting effects is not so great as to make the importance of this feature relatively so great as might be at first supposed.

12. Communication.

Prompt communication by telephone, telegraph, mail, etc., is likewise of great importance to the success of an exposition, but a reasoning similar to that given for light and power leads me to give it a comparatively low relative importance.

13. Intangibles.

In addition to the above considerations there are certain other matters deserving consideration, but to which I have not ventured to attribute definite figures of relative importance. For example:

Increase in business of merchants during the Exposition.

Increase in taxable property of the City after the Exposition.

Effect on the City's future planning and development. (It is conceivable that some sites might have a specially good effect and others a deleterious effect).

Effect of permanent improvements upon the minds of Philadelphians.

Effect of permanent improvements upon future tourist traffic to Philadelphia, etc.

It is hardly to be expected that I have thought of all the requirements of equal importance to those above, and discussion will doubtless bring out some of these. Further, different minds will unquestionably view the relative importance of these items from somewhat different angles and it ought to be possible by a consideration by the members of the Committee and a discussion to bring about a comparative rating much more valuable than any attempt of mine.


Area of World's Fair 7,150,000 Sq.Ft. = 164 acres
with Lemon Hill 9,250,000 Sq.Ft. = 214 acres
TO BELMONT
AVIATION FIELD
THE CASCADES
COURT HOUSE
LEMON HILL
THE STADIUM
THE PARKWAY APPROACH
BROAD STREET STATION
MARKET
SUGGESTED LOWER FAIRMOUNT PARK PLAN
THE FAIRMOUNT PARKWAY AND THE SCHUYLKILL BANKS
Reproduced from Original by Paul P. Cret.
Accompanying report of
SESQUI-CENTENNIAL COMMITTEE
THE ENGINEERS CLUB OF PHILADELPHIA
January-1922

PLATE V

APPENDIX D

REPORT OF THE COMMITTEE ON CIVIL ENGINEERING, HEALTH, COMFORT, ETC.

Sesqui-Centennial Committee,
Engineers' Club of Philadelphia,
Philadelphia, Penna.

TO THE CHAIRMAN:

In compliance with your request the Civil Engineering Sub-committee on the selection of sites has examined the twelve sites proposed for the Sesqui-Centennial Exposition and submits the following as its report:

After our Committee was organized we were advised that the proponents of Sites Numbers 1, 2 and 3 had agreed to concentrate their efforts on the adoption of Site Number 3, which we have considered as the "Pennypack Park Site." This practically reduced the number of sites for consideration to twelve.

Each site was examined by the various members of the Committee, and when their reports indicated that further consideration ought to be given to some sites which possessed special advantages, the engineers or architects representing those sites were given hearings before the full Sub-committee, which afterwards made additional examinations on the ground.

In our judgment, in the selection of a site for the Sesqui-Centennial Exposition, there are two factors which should receive first consideration as an aid in arriving at a decision.

The first is a question of certain costs entering into the preparation of a site, which do not belong primarily to an international exposition.

The second is the suitability of the site, which would permit the complete development of an Exposition of the proper scope.

The first would include the cost and loss of time in condemning and procuring the necessary property; the cost of preparing the ground for exposition purposes, which would embrace the cost of filling, excessive excavation and special costly construction; the character of the subsoil, which may necessitate heavy outlays for foundations; heavy costs in the construction of water mains or sewerage; the cost of extending and adjusting transportation systems, both steam and electric; and the cost of constructing highways and bridges for the purpose of making the grounds accessible.

An indirect cost might also be considered as resulting from the destruction of industries or the checking of their growth.

The second, or the suitability of the site, embraces the following elements:

(a) Size.
(b) Shape.
(c) Topography—Water supply, sewerage drainage, grading.
(d) Accessibility—Transportation, hotel and restaurant accommodations.
(e) Comfort—Insects, odors, smoke and atmosphere.
(f) Aesthetics—Environment.
(g) Salvage.
(h) Automobile parking and camping.

While many of these elements come within the scope of other subcommittees, it is necessary for us to give them general consideration, so that this report may be of some practical value.

The following is a discussion of the various sites which have been submitted to us for investigation:

SITE NO. 3—PENNYPACK PARK SITE.

The Pennypack Park Site is situated on the Roosevelt Boulevard above Cottman Street, and includes within its limits Pennypack Creek and Park. The area suggested is about one thousand (1,000) acres, of which about fifty (50) per cent. is City-owned. This area can be considerably increased if necessary.

Topography.

A large proportion of the tract is slightly rolling and can easily be developed for exposition purposes. The Pennypack Creek valley is a beautiful one and can readily be made very attractive.

The water supply presents no difficulties as it is within easy reach of the Lardner's Point pumping station.

The sewage also is easily disposed of by constructing extensions from city sewers. The estimated cost of constructing the necessary extensions of water mains and sewers is $3,000,000.

Foundations and Grading.

These present no serious difficulties unless construction occurs along the creek valleys and drainage axes.

Salvage.

Water mains and sewerage extensions would constitute a part of the City's development and are largely salvage, amounting approximately to $2,500,000.

In our judgment, of all the northeast sites proposed this should receive the highest rating.

SITE NO. 4—UPPER ROOSEVELT BOULEVARD.

This site is situated immediately north of the junction of the Roosevelt Boulevard with Oxford avenue. It contains about seven hundred (700) acres, part City-owned.

Water supply and sewerage extensions can be easily constructed at a cost of about $2,000,000.

Topography.

The surface of the ground has no great relief and it lacks the features that could be developed through having a fair-sized stream of water contiguous to or flowing through it.

Foundations and grading can be accomplished at a comparitively low cost.

This site is destitute of even a fair number of medium size trees, which ought to be considered in the item of public comfort.

The view and environment are not equal to Site No. 3.

Salvage is obtained almost entirely through water supply and sewerage extensions.

SITE NO. 5—THE LOWER BOULEVARD SITE.

This site is situated north of the Roosevelt Boulevard and along Tacony Creek. It embraces about seven hundred (700) acres of which Tacony Park is City-owned.

Water supply and sewerage offer no difficulties.

Topography.

The site is capable of excellent development with some water treatment along Tacony Creek. There is sufficient level ground for buildings, although they would probably have to be placed in two or more groups.

Foundations are as easily constructed as on Sites Nos. 3 and 4, except where filling has been done or is necessary.

Grading.

The item of grading would probably be in excess of Sites Nos. 3 and 4.

It is possible that mosquitos prevail during the summer months.

Salvage.

The estimated cost of extending water mains and sewerage is $2,350,000, of which the estimated salvage is $1,700,000.

SITE NO. 6—JUNIATA PARK SITE.

This site comprises about six hundred (600) acres and includes part of Tacony Park. It is situated north of Butler street, and between the Oxford branch of the Pennsylvania Railroad and Tacony Creek.

Water and Sewers.

These present no serious difficulties, the estimated cost of both being about $1,750,000; the salvage of which amounts to about $1,050,000.

Topography.

The surface of the site is quite rolling and is capable of very fair treatment, the Tacony Creek valley on the north being quite beautiful.

Foundations.

There would probably be about fifteen (15) per cent. excess in the cost of foundations over Sites 3, 4 and 5.

Comfort.

This is rated rather low on account of the increasing industrial development immediately surrounding this site.

SITE NO. 7—THE ROXBOROUGH SITE.

The Roxborough Site extends from the upper Wissahickon valley southwestwardly along the Philadelphia-Montgomery County line to the Schuylkill River. It has a frontage of 3,000

feet along the Schuylkill River and about 6,000 feet along the Wissahickon Creek, and is largely within City limits. It embraces about 2,000 acres, practically all within the boundaries of the Houston estate, and for which we have been assured the City will have control for Exposition purposes, without any compensation being exacted.

Topography.

The site is an exceedingly beautiful one, possessing the highest general elevation of any examined, and commanding at various points beautiful and extensive views of both the Schuylkill and Wissahickon valleys. It is intersected with streams and wooded ravines, which could be developed to a high degree by the landscape architect, and possesses a sufficient amount of level ground for the location of the maximum number of Exposition building sites with the necessary avenues and approaches. It also has sufficient available ground for automobile parking, aviation fields, Stadium, and all other Exposition purposes. From a health and public comfort standpoint, owing to its topography and elevation, this site is unexcelled in the vicinity of the City.

Water Supply.

The water supply presents no serious difficulties and any improvements made to the present plant and system would be permanent and are under consideration by the Bureau.

The sewage can be provided for by an extension of the intercepting sewers along the east side of the Schuylkill River and up the Wissahickon valley, and would form part of the City's permanent sewerage system.

The architects representing the proponents of this site—Messrs. DeArmond, Ashmead and Bickley—state that the cost of extending a forty-two (42) inch sewer up the Wissahickon valley to the site would be seven hundred and twenty thousand (720,000) dollars. There are no estimates furnished for the extension of the sewer along the east side of the river from Shawmont avenue, nor were estimates furnished for obtaining a proper and abundant water supply.

The problems of surface drainage and foundations for structures do not present any difficulties.

Salvage.

With the exception of the items of construction in direct relation to the Exposition itself and the temporary buildings, all preliminary construction, including water mains and sewers, could be classified as having complete salvage. In addition there would be a very important indirect benefit to the City in the construction of permanent improvements, which would materially aid in the development of a large section.

The disadvantages of this site are obvious, in that there is a present lack of transportation facilities, and that the highways reaching it are few in number and easily congested with traffic. The only railroads which at present reach the tract are along the east bank of the Schuylkill River and are two hundred and seventy-five (275) feet below the general level of the site. This would require special elevators and escalators to transport visitors to the Exposition level.

It is estimated that the cost of constructing a high-speed electric railway from City Hall to the site would be fifteen million (15,000,000) dollars without any allowances for equipment.

The distance this site is from the center of the City, nine (9) miles, might also unfavorably affect the size of the attendance. Hotel accommodations also constitute another problem. This location is in an undeveloped section of the City, and the erection of hotels on the site in its immediate vicinity presents some speculative features that might deter capital from embarking in an extensive undertaking of this character.

SITE NO. 8—THE UPPER FAIRMOUNT PARK SITE.

The Upper Fairmount Park Site is bounded by the Schuylkill River on the east, Belmont avenue on the west; and extends northwardly from Memorial Hall to the river at the Falls bridge. This site, embracing approximately eight hundred (800) acres, with about three hundred (300) acres additional available, is City-owned, and is advocated by Chester E. Albright, former City Engineer and Surveyor, who has made a very thorough and comprehensive study of it.

This location presents many advantages:

Being City-owned, it is available without cost or delay.

There are few foundation problems to be encountered, as the subsoil conditions in general are most excellent.

The water supply is near at hand and can be extended at little cost. Any mains or additions to the pumping plant are in contemplation by the Bureau as part of the future improvement to the system.

The sewage disposal requires somewhat more study, but its solution is easy and at a low cost.

The topography is well adapted for the purpose. While the elevation above the river level is somewhat below that of the Roxborough Site, the relief is sufficient to insure cool breezes and give commanding views of the beautiful Schuylkill River, Fairmount Park, and the Schuylkill valley.

The shape and size permit Exposition development on fairly level ground. Congestion in the grounds and at transportation terminals can be avoided by the ease with which a large number of entrances can be established. There are also sufficient areas within the limits of the grounds and adjacent to it, to provide ample parking for automobiles.

The location is adjacent to that part of the City in which normal development and growth would warrant the erection of permanent hotels and apartments.

Its accessibility, through steam and electric railway lines, by means of streets and highways, and even by water transportation, is readily apparent from an examination of a general plan.

Salvage.

The cost of preparing this site for use for Exposition purposes, including water supply, sewerage, grading and the construction of three (3) small bridges, would not, according to the engineer, exceed one million (1,000,000) dollars, which to a large degree represent permanent improvements.

The principal objection that has been urged against the selection of this location is that being a part of Fairmount Park it would bar the public from its use for a term of from four to six years; and the development and construction on the grounds for Exposition purposes might cause some damage to shrubbery and trees.

It is evident, however, that even during the period of Exposition construction, the public would be barred from the grounds in part only; and it seemed to be the opinion of the Committee when the site was examined, that plants and trees would be but slightly damaged.

SITE NO. 9—LOWER FAIRMOUNT PARK OR CRET PLAN.

This plan, as presented to the Subcommittee by Prof. Cret, contemplates the development and use of the Parkway, Lemon Hill section of Fairmount Park, and the use of a comparatively narrow zone along the banks of the Schuylkill River, extending on the west side from Filbert street to Vine street.

The water supply for Exposition purposes offers no problems under existing conditions.

The sewage problem depends largely upon what disposition is made of the sewage discharging into and polluting the Schuylkill River. This is a problem involving so much study and such heavy costs that we can only refer to it slightly in this report.

The site is an accessible one, and as it is fringed by a developing part of the City within a few minutes' walk from City Hall the construction of hotels and apartment houses should be permanent.

One great advantage of this location is that a number of important buildings erected for Exposition purposes could be made of a permanent character and used in the future, such as Federal, State and Municipal Buildings.

Salvage.

Salvage is one of the most important factors in the consideration of this site. The permanent advantages accruing to the City would be the improvement of the banks of the Schuylkill River as part of the Fairmount Park system, the removal of what constitutes an open sewer in the Schuylkill River below the dam, and the removal of some objectionable features along the river.

The enormous outlay necessary in the mere preparation of this site and the intricate engineering problems involved before actual Exposition construction can be begun, the cost of which is estimated from $20,000,000 to $30,000,000, at once raise the question whether in view of other urgent needs for municipal improvements, such as transit, sewers, and highways, the City is justified in expending so large an amount of money at this time, even though the salvage is very great.

From an engineering standpoint, the Cret Site presents a number of serious disadvantages:

The Schuylkill River below the dam is full of sewage which is carried to the foot of the dam by flood tides. The elimination of this nuisance will be both difficult and costly.

The condemnation of the property on the east and west sides of the river will be very expensive and may involve considerable loss of time and some litigation.

The preliminary work will necessitate heavy construction expenses, such as covering the railroad tracks on the east bank, heavy river wall construction on both sides of the river, the realignment of tracks on the west side,

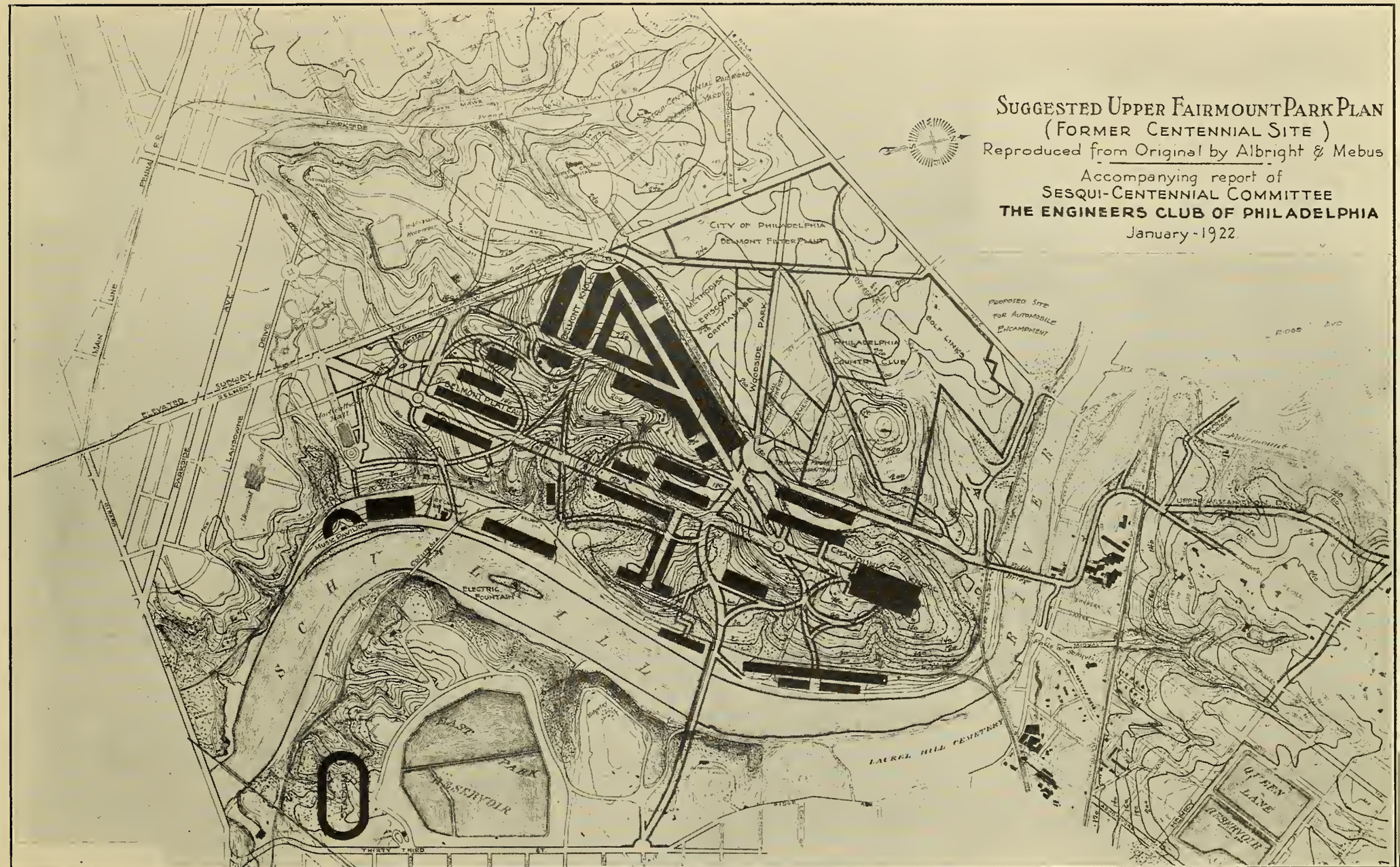

SUGGESTED UPPER FAIRMOUNT PARK PLAN
(FORMER CENTENNIAL SITE)
Reproduced from Original by Albright & Mebus
Accompanying report of
SESQUI-CENTENNIAL COMMITTEE
THE ENGINEERS CLUB OF PHILADELPHIA
January - 1922
CITY OF PHILADELPHIA
BELMONT FILTER PLANT
PROPOSED SITE FOR AUTOMOBILE ENCAMPMENT
PHILADELPHIA COUNTRY CLUB
GOLF LINKS
WOODSIDE PARK
METHODIST EPISCOPAL ORPHANAGE
BELMONT PLATEAU
MUSIC PAVILION
ELECTRIC FOUNTAIN
SCHUYLKILL
RIVER
EAST PARK RESERVOIR
LAUREL HILL CEMETERY
QUEEN LANE RESERVOIR
MAIN LINE
PARKSIDE
LANSDOWNE
ELEVATED
SUBWAY
BELMONT
THIRTY THIRD ST.
UPPER MONTGOMERY DRIVE

PLATE VI

and, owing to the nature of the ground, possibly extra heavy foundation construction along the river. In addition the location as shown on the plan does not in our judgment indicate an area sufficiently adequate to develop the Exposition along the lines suggested by the General Committee.

The cost of the construction of the two bridges shown on the plan would also constitute a heavy item.

The location of the buildings along the river, with their elevations only a few feet above the water level would not give a high degree of public comfort during the hot summer months; and smoke and odors carried by the southwest winds from the Pennsylvania Railroad yards and vicinity would also be an objection.

SITE NO. 10.—KNOWN AS THE LEAGUE ISLAND PARK SITE.

SITE NO. 11.—39TH WARD PLAN (IMMEDIATELY NORTH OF LEAGUE ISLAND).

SITE NO. 12.—40TH WARD PLAN (CANNONBALL FARM PLAN).

SITE NO. 13.—40TH WARD PLAN (IMMEDIATELY NORTH OF CANNONBALL FARM).

SITE NO. 14.—HOG ISLAND PLAN.

These tracts were all compared on the basis of an assumed area of one thousand (1,000) acres each and in accordance with the items mentioned in the first part of this part of the report.

1—TOPOGRAPHY.—All five of these sites possess the same general topographical characteristics, being located in the basin of the Delaware and Schuylkill Rivers, all exceedingly low-lying elevations, all more or less subject to overflow by tides if not protected by dikes, and all virtually lacking in contour, being practically level.

(a) Drainage.—The possibilities of proper drainage—assuming to start with that the sites will necessarily be graded to a higher elevation than at present as a preliminary to improvement of any kind—are excellent and could be fairly economically accomplished by discharging through short trunk sewers directly into the adjacent river channels. Salvage would be large, as these drains could be utilized later when the temporary Exposition area is converted into permanent housing districts.

(b) Sewage.—Under the assumption that the surface elevation of these sites would be raised to an elevation approximately twelve (12) feet above low tide, it would be practicable to construct sewers to discharge directly into the Delaware River, but whether this would be legally possible is a grave question. There are no existing available trunk sewers in these sections to which connection could be made, and probably a complete system of sewers connected to a central pumping station with a treatment plant adjunct thereto, would be necessary to satisfy the demands of the State Department of Health.

Some salvage on these improvements could reasonably be expected, but not in any large proportion of their cost.

(c) Water Supply.—There are no existing water mains of sufficient size and proximity capable of supplying water for Exsition purposes at these sites. In all probability complete new conduits would have to be constructed from the nearest filtration plants, either at Torresdale or Queen Lane, at a large expense.

To properly meet the maximum demands of a population such as that which would at certain times be within the Exposition enclosure, would require, it is roughly estimated, approximately a thirty-six (36) inch water main. This, with the auxiliary developments necessary in connection with its operation, probably would cost approximately $2,000,000. The salvage would be limited, as the permanent population of this tract would be insignificant compared with the temporary population during Exposition times, and its demands for water would be in corresponding minor proportion.

(d) Shape.—The shape of any of the properties under consideration is such as to permit symmetrical development and is believed to be entirely satisfactory.

(e) Grading.—As a prerequisite to the improvement of these tracts for Exposition purposes, it is felt that they should be raised six (6) feet in elevation from their present average elevation, which is below the plane of high tide in the Delaware River, to a plane approximately twelve (12) feet above low tide. To do this would require a very large amount of filling, estimated at 6,000,000 cubic yards for the best of the sites, and 12,000,000 cubic yards for the worst of them.

If deposited hydraulically the surface of the fill would be exceedingly soft and probably not susceptible of development for building purposes for a period of one and one-half (1½) to two (2) years after placing. If made with dry fill, the sources of material would be remote, somewhat uncertain, and expensive.

Under the best conditions the cost of these grading operations would be $3,000,000 and under the worst $12,000,000 or more. Also, the delay in commencement of building operations occa-

sioned by the grading operations would be most serious, ranging from a minimum of one to a maximum of two years or more.

2—Comfort—*Odors and Smoke.*—With respect to odors and smoke these sites are of varying degrees of desirability. All of them are within reaching distance of objectionable odors from chemical manufacturing plants, fertilizer and reduction plants, oil refineries and gas works—some in very near proximity to the source of these odors and smoke, and others more remotely removed.

Site No. 10 would be the least objectionable in this respect and could be rated fairly high, following which Site No. 14 would be next in order, and then Sites Nos. 12, 11 and 13 in increasing disfavor, the last-named being highly objectionable and practically out of consideration on this account.

Mosquitoes.—The entire Delaware River valley, covering Sites Nos. 10 to 14, is more or less mosquito infested at all times, and sometimes very badly. To insure the comfort of visitors to the Exposition, if located on any of these sites, remedial measures for the elimination or control of the mosquito pest over the low grounds between Philadelphia and Marcus Hook would have to be taken. From actual experience in the past it is estimated that a campaign of this kind to be at all effective would cost upwards of $1,000,000.

Atmospheric.—The wind velocity on most of these sites during the summer season is low and the percentage of humidity correspondingly high. Of the five sites, Nos. 10 and 14 are superior to the others. These two, on account of their extensive Delaware River frontage, would derive some benefit from river breezes, although the normal direction of wind currents during the summer months is from the land rather than the water at both of these sites.

3—Sub-Soil as Affecting Foundation Costs.—All of the Sites, Nos. 10 to 14 inclusive, are located on alluvial soil and to a large extent are partially submerged tidal lands. The soil is soft in character for a depth of from 30 to 60 feet below the surface, and quite incapable of sustaining concentrated loads from foundations. All of the available data, of which there is considerable, point to the probability that piles will be required for all concentrated loadings of the Exhibition development. These would vary from 30 to 70 feet in length and would cost approximately twenty-five (25) dollars per pile.

It is estimated that 150,000 piles would be required in the 300 acres of buildings on the grounds, entailing an additional foundation cost over that on hard ground of $3,750,000.

4—Aesthetics—*View from and View to Surroundings.*—In these respects Sites Nos. 10 to 14 vary greatly in merit. In the cases of Nos. 11 and 13 the sights and scenes with which visitors would be surrounded are unpleasant. Site No. 12 is somewhat better, but still highly objectionable. In the case of Site No. 10 these conditions are materially improved, and in consideration of the admirable view from and to the Delaware River, and from and to League Island Park, it is entitled to relatively high rating. It is somewhat superior in this respect to Site No. 14, which, however, possesses considerable merit on account of its river prospects.

Water Frontage.—Sites Nos. 10 and 14 each have a splendid water frontage of more than a mile in length, located on one of the country's greatest rivers and principal arteries of marine commerce. The possibilities of impressive utilization of this frontage are very great, and both sites are entitled to the highest possible consideration on this account.

Site No. 11 possesses practically no water frontage. In Site No. 12 its water front is indifferent as compared with Nos. 10 and 14, and in Site Number 13 the water front is highly inferior.

Approaches.—The principal approaches to all of these sites are comparatively limited in number and in the main are through sections of the City not highly developed. Sites Nos. 10 and 11, approached principally by way of South Broad street, are the best of this group, and with some rather radical improvements of present conditions this line of approach could be made pleasing. The approaches to Sites Nos. 12, 13 and 14 are poor, and the possibilities of improving them to any extent are remote.

5—Size and Shape.—The size of each one of these sites is adequate for any demand reasonably to be conceived for exposition purposes, and as formerly stated, the shape of them is such as to permit symmetrical and satisfactory development.

6—Excess cost of Development to Ground Surface.—The excess cost of development of any site in this group—by which "excess" it is meant to include items of cost to which other available sites would not be subjected—includes in the case of each of these properties the cost of additional water conduits, of a large quantity of grading, of an extensive mosquito elimination campaign and of the driving of a very large number of piles for foundation purposes.

These costs would range from approximately $11,000,000 in the case of Sites Nos. 12, 13 and 14, to $12,000,000 for Site No. 10, and $14,000,000 for Site No. 11.

7—Facilities for all Classes of Exhibits.—In the case of the best of these sites, Nos. 10 and 14, admirable facilities for all classes of aquatic exhibitions are afforded, but for anthropological exhibits, native and aboriginal villages of various kinds, etc., the topography is not sufficiently varied, tree growth is entirely lacking, and the sites would not be as well adapted from this point of view as those in hill country. Sites Nos. 12, 13 and 11, in the order mentioned, are distinctly inferior to the others in these particulars.

8—Automobile Parking Area.—All of the sites in this group are of sufficient size to afford ample facilities for the storage of any probable number of motor cars.

Even on first consideration of these sites it was manifest that the League Island Park Site and the Hog Island Site possess material advantages over the others suggested in this group, and further, it was obvious that the mile or more of water front available at both of these tracts created an undeniable and impelling attraction. High regard has been borne in mind of the great possibilities of aesthetic and impressive development of these waterfronts, and the possibilities of utilization of the river itself in connection with striking illuminations at night, pageants by both night and day, seaplane exhibitions, and aquatic sports of every kind.

These advantages, and in the case of the League Island Park Site, undoubtedly the preferable one of the two, its proximity to the Philadelphia Navy Yard, one of the country's main naval stations and therefore a point of interest to practically all citizens both from coastal as well as inland sections, rate the development possibilities under the Joseph Huston Plan very high.

The facts, (1) that the League Island Park Site is in large proportion low lying, subject to tidal inundation except as protected by dikes, thus involving a great amount of expensive earth fill to bring it up to what can be considered an acceptable elevation for drainage, sewerage and building purposes; (2) that the time required to place the necessary fill, to obtain it, and to consolidate it would fix the time of beginning building construction at the Spring of 1924; (3) That the character of the subsoil is such as to necessitate piles under practically every structure on the grounds; (4) that the cost of introduction of proper water supply would be excessive; and (5) that the serious mosquito problem, of which the considerations of health and comfort demand the solution, would be expensive; all point to the conclusion that the adoption of this site and the absorption of these large excess costs into the Exposition budget could be justified only with great difficulty.

The sum total of these costs, amounting to approximately $12,000,000 for what might be designated as purely preparatory expenses, when compared with some of the available sites, in our opinion makes it somewhat impracticable.

The one outstanding advantage of the site is its water frontage, concededly a tremendous and unique one, but from the standpoint of prudent conservation of Exposition funds and justifiable financial engineering, probably does not warrant the large expenditure necessary for this tract over that involved at other sites which are on the whole as equally well adapted for Exposition purposes.

Conclusions.—The Committee has decided from an engineering standpoint after most careful consideration that the upper Fairmount Park Site, known as No. 8, should receive the highest rating, with the Roxborough Site ranking as No. 2.

Recommendations.—Based on the somewhat intensive study that we have given the special elements assigned us in the consideration of all the sites, and our general engineering knowledge and experience, the Committee unanimously makes the following recommendations:

First—That the main part of the Exposition be placed in that part of West Fairmount Park known as Site No. 8.

Second—That the Parkway be completed, together with the Municipal Art Building and Court of Honor, in time for the Exposition, and that the Fine Arts Exhibit, embracing painting, sculpture, tapestry, architecture, etc., be separated from the main body of the Exposition and placed in buildings which are now under construction.

That as many permanent Federal, State, and Municipal buildings as possible be placed on or along the Parkway.

This second recommendation eliminates the enormous cost resulting from the adoption of the Cret Plan in its entirety.

Third—That we would further recommend the Stadium and athletic site be located north of Girard Avenue Bridge and east of the Schuylkill River, on the site which is common to both the Fairmount Park Plans and Cret Plans.

The City would thus utilize to the fullest extent the construction in which it is now engaged, or has in immediate contemplation, and would give a magnificent and unexcelled approach to the main part of the Exposition.

Appended to this report is a table showing the engineering ratings of the various sites prepared by the Subcommittee on Engineering.

Respectfully submitted,

(Signed) BENJ. FRANKLIN, *Chairman.*
WALTER F. BALLINGER,
M. WARD EASBY,
A. R. LINDSEY,
JOHN MEIGS,
R. A. PRENDERGAST,
J. A. VOGLESON.
JOSEPH C. WAGNER,

FAIRMOUNT PARK-PARKWAY PLAN.

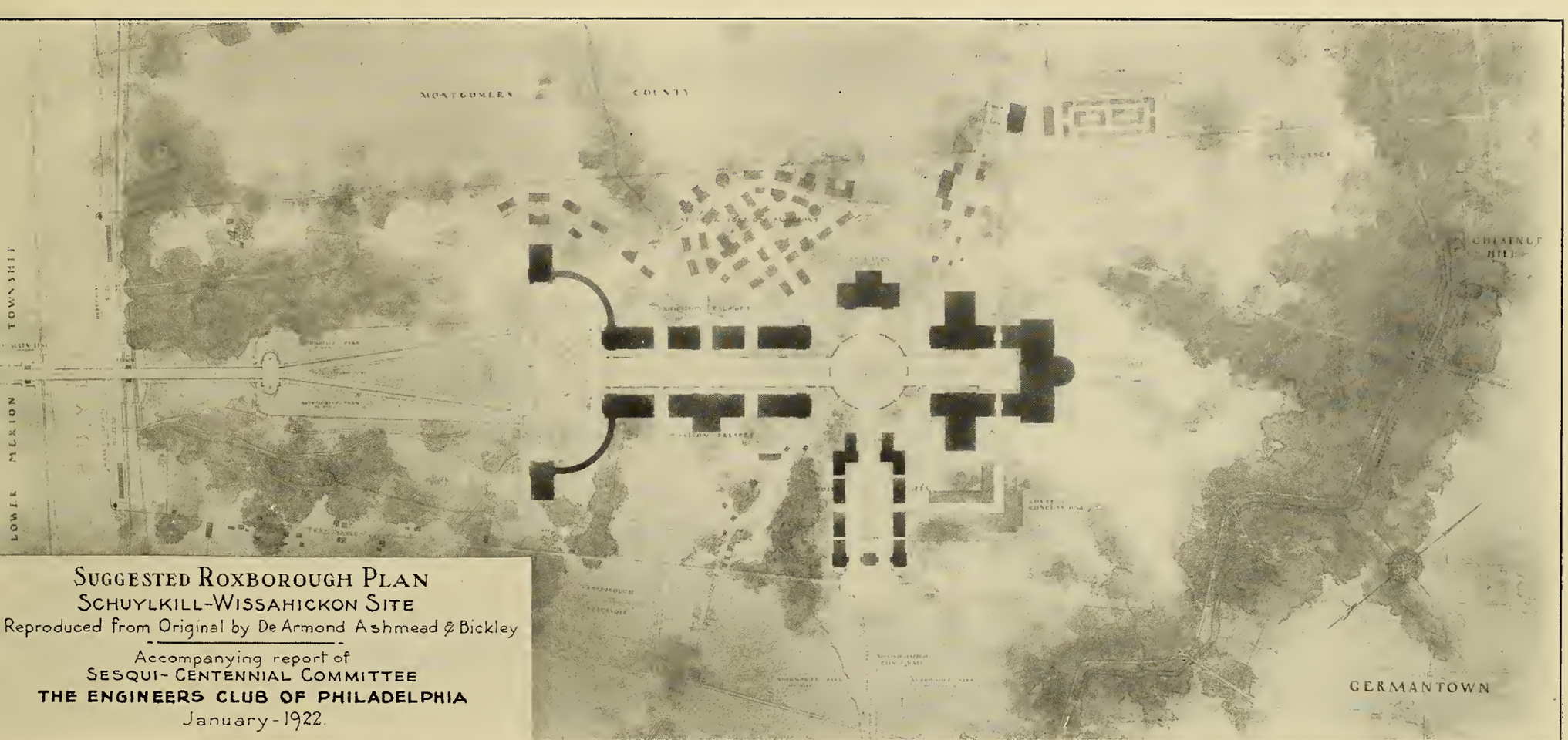
At the time this report was made the *Fairmount Park-Parkway Plan* was not under consideration. As it permits the use of the Fairmount Park territory recommended herein, and gives the leeway of extension into the Lower Fairmount Site, without requiring the many expenditures called for in the latter site, the Chairman of the Committee on Civil Engineering, as its representative, joined in giving it the highest rating. (Appendix B.)

TABLE OF RATINGS

Civil Engineering Subcommittee

Rating	*Site*	*Remarks*
(1)	8	Upper Fairmount Park.
(2)	7	Roxborough Plan.
(3)	3	Pennypack Park.
(4)	4	Upper Roosevelt Boulevard.
(5)	5	Lower Roosevelt Boulevard.
(6)	6	Juniata and Tacony Parks Plan.
(7)	10	League Island Park Plan.
(8)	14	Hog Island Plan.
(9)	12	40th Ward Plan, or Cannonball Farm.
(10)	9	Lower Fairmount Park or Cret Plan.
(11)	11	39th Ward Plan, immediately north of Hog Island Park Plan.
(12)	13	40th Ward Plan, immediately north of Cannonball Farm.

Note.—These ratings are established on an engineering basis only.



SUGGESTED ROXBOROUGH PLAN
SCHUYLKILL-WISSAHICKON SITE
Reproduced from Original by De Armond Ashmead & Bickley

Accompanying report of
SESQUI-CENTENNIAL COMMITTEE
THE ENGINEERS CLUB OF PHILADELPHIA
January-1922

PLATE VII

APPENDIX E

REPORT OF THE COMMITTEE ON TRANSPORTATION, ACCESSIBILITY, ETC.

Philadelphia, Pa., January 23, 1922.

Sesqui-Centennial Committe,
Engineers' Club of Philadelphia,
Philadelphia, Pa.

To THE CHAIRMAN:

Pursuant to instructions of your Committee at meeting held December 15th, the Committee on Transportation has made a study of the plans, statistics and information furnished by your Committee on Statistics, and of other information and data available to them on the various sites proposed for the Exposition as related to transportation and accessibility, and beg to report as follows:

The result of this study and investigation is shown on a table of percentage ratings, herewith submitted, entitled "Sesqui-Centennial—Transportation and Accessibility—Rating in Percentage of Suggested Sites—Transportation Committee—Engineers' Club of Philadelphia." The following important elements affecting transportation have been duly considered in the preparation of this rating:

First—Accessibility.

Second—Steam railroads (freight and passenger facilities).

Third—Electric railways—suburban.

Fourth—Street railways.

Fifth—Water Transportation.

Sixth—Highways—automobiles, motor busses, taxicabs, trucks, and parking facilities.

The function of the steam railroad as related to the Exposition is:

First—Delivery to the site of the Exposition of building material, machinery and other bulk freight required for construction, and the delivery of freight consigned to exhibitors.

Second—Operation of excursion trains from outlying cities and towns to the Exposition, where adequate terminals, tracks, platforms and empty car yards must be provided.

Third—Transportation of visitors to the Exposition from distant points by special or regular train service, arriving and departing from the main railroad passenger terminals.

The function of suburban electric railways is that of furnishing transportation from the territory surrounding Philadelphia to their existing terminals in the City. Unless a site is chosen which is accessible to some of these lines they will not be a factor in the local transportation problem, as passengers would have to transfer at their terminals to street railway or subway and elevated lines.

The function of street railway lines—surface, subway and elevated—is that of providing transportation for visitors and the local population from their homes, hotels, boarding houses and railroad terminals in the different sections of the City to and from the Exposition. The construction of an adequate terminal within or adjacent to the Exposition, together with the routing of car lines to make as accessible as possible all sections of the City, will be necessary.

River transportation will be negligible unless a site is selected adjacent or in close proximity to the Delaware River, in which event a large number of visitors from points in New Jersey, and from Chester and Wilmington, can be landed by existing and new ferry and steamboat lines.

Highways and Boulevards—automobiles, taxicabs and motor busses—will be important elements in the transportation of visitors to the Exposition, both from sections within the City and from points outside the City, within a radius of one hundred and fifty miles. The facility for parking, therefore, is one of the most important considerations in the determination of a site, and a tract or tracts of ground of a total area of 100 to 150 acres adjacent to the Exposition grounds would seem to be necessary.

It may be found convenient to visitors to provide much of the parking space inside the Exposition grounds.

Consideration should be given to camping sites for automobile tourists, such as are maintained in the large western cities. These sites, however, need not be adjacent to the Exposition.

A statement describing the existing transportation facilities

and other features affecting transportation to the site under consideration, is appended.

We would not care to say that any one of the sites considered is impracticable for transportation service, but it is apparent that some of the proposed sites cannot be adequately served, and the inability to properly transport people to and from the Exposition would certainly work against the good results expected of it. We have based the rating on a normal and reasonable expenditure for steam railroad and street railway line extensions and terminal facilities. Unquestionably, even the sites with the lowest ratings can be made reasonably accessible by the expenditure of large sums of money for steam railroad, street railway and rapid transit lines, and bridges and highways. It must be realized, however, that many of the facilities that might be provided by these large expenditures would be unproductive and a considerable portion of same would be abandoned after the close of the Exposition.

In conclusion we would call particular attention to the fact that the ratings for transportation and accessibility of several of the suggested sites are not so materially different that we would feel like recommending, from the transportation point of view alone, any particular one of the highest rated sites.

Respectfully submitted,

(Signed) R. H. HORTON,
HENRY H. QUIMBY,
SAMUEL T. WAGNER,
S. A. SLOAN,
E. B. TEMPLE, *Chairman.*
Transportation Committee.

TRANSPORTATION AND ACCESSIBILITY—RATING IN PER CENT. FOR SUGGESTED SITES.

	Per Cent.
Pennypack Park	39
Upper Roosevelt Boulevard	49
Lower Roosevelt Boulevard	50
Juniata and Tacony Parks	57
Roxborough	25
Upper Fairmount Park (Centennial)	59
Lower Fairmount Park (Cret)	62
League Island Park	58
Revised League Island Park, north of Terminal Avenue†	58
Fortieth Ward	53
Cannon Ball Farm	49
Hog Island	47
Fairmount Park-Parkway Site includes the Fairmount Park (Cret) and Fairmount Park (Centennial) Sites, and may therefore be rated as on a parity with them.	

†Rating is based on present railroad facilities and terminals in South Philadelphia.

LOWER FAIRMOUNT PARK SITE (CRET PLAN)

Steam Railroads.

This is the most centrally located of any of the sites suggested. It is close to the center of the population of the City, both east and west of the Schuylkill River, and more readily accessible from the large hotels and apartment houses in the central part of the City than the other sites. It is within reasonable walking distance from Broad Street Station, the Reading Terminal, B. & O. R. R. Station at Twenty-fourth and Chestnut streets, and West Philadelphia Station of the Pennsylvania Railroad. Girard Avenue Station, on the Philadelphia & Reading Railway, is directly adjacent to the northeastern section of the site.

The Baltimore & Ohio and the Philadelphia & Reading Railway main lines are contiguous to a considerable portion of the area included in the site, and there are reasonable possibilities for developing adequate stations on these railroads to serve the Exposition, although it does not seem feasible to construct a terminal within the site of the Exposition where excursion trains from outlying cities and towns can be handled. The main terminals of the Philadelphia & Reading Railway at Twelfth and Market streets, and Broad Street Station of the Pennsylvania Railroad, cannot be considered as adequate to handle local Exposition traffic, as they are now used to capacity during the rush hours of the day. The Pennsylvania could probably construct a terminal adjacent to Thirtieth street, in the vicinity of Spring Garden street, or on the New York division at Engleside, for excursion trains.

This site, as presented by the Fairmount Park Art Association,

involves the use of land on both banks of the Schuylkill River from Fairmount Dam to the Pennsylvania Railroad bridge, and would necessitate roofing over of the Baltimore & Ohio Railroad tracks on the east side of the river and the abandonment of the abattoir and stockyard and tracks serving same on Pennsylvania Railroad property on the west side of the river.

Street Railways—Surface, Elevated and Subway Lines.

This site is within reasonable walking distance of the Fifteenth and Nineteenth street stations of the subway, and of a number of cross town lines, viz., Market and Arch Streets, and the car lines crossing Spring Garden Street and Girard Avenue bridges. Some re-routing of car lines may be possible that will make it accessible from the more remote sections of the City not served by subway or elevated lines.

While the lines serving this site are adequate, they are now the most congested in the City during the peak hours and, therefore, the handling of Exposition crowds would tax them severely and cause great inconvenience to their regular patrons.

The question of a street railway terminal within or adjacent to the Exposition grounds we believe can be taken care of.

Highways.

This site would be adequately served by highways from all sections of the City and from outlying points, as all main highways leading into the City connect with improved City streets leading directly to the main entrance of the Park at Dauphin Street, Girard Avenue and Green Street, and there are adequate driveways within the park outside the limits of the Exposition site, to take care of this kind of traffic.

The problem of parking space for automobiles, however, would seem to be rather difficult. There is practically no vacant ground adjacent, of any considerable acreage, that would provide adequate parking space. Presumably parking space would be needed at each of the main entrances to the Exposition and it has been suggested, to overcome the difficulties of parking at this site, that special structures be built. We are not prepared to say whether the cost of providing sufficient parking in this manner would be reasonable or prohibitive, as it would largely depend on the salvage value of the structures. It has been estimated by the Statistical Committee that at least one hundred to one hundred and fifty acres for parking will be required to take care of normal automobile traffic to the Exposition.

Water Transportation.

With regard to water transportation this would be of minor importance at this site, as there could be no transportation by water except by small boats on the Schuylkill River.

UPPER FAIRMOUNT PARK (CENTENNIAL) SITE.

Steam Railroads.

From the standpoint of accessibility this site ranks second, as it is accessible to the dense population north of Market Street and both east and west of the Schuylkill River, and to the suburbs northwest of the city.

The Pennsylvania Railroad operates the Belmont branch, which is located within the site, extending from Girard Avenue to Columbia bridge, where it connects with the Philadelphia & Reading Railway.

The Philadelphia & Reading main line, which is also located within the site along the west bank of the Schuylkill River, extends from Columbia bridge to the Falls of Schuylkill.

Wynnefield Avenue Station, on the Schuylkill Valley branch of the Pennsylvania Railroad is within reasonable walking distance of the Park entrance at Wynnefield avenue.

The Baltimore & Ohio Railroad would reach this site over the Reading Railway, and would have to use the same station facilities.

It would seem to be rather difficult to develop any railroad terminal within the Exposition site adequate to handle the necessary excursion trains, and therefore traffic of this character would probably have to be handled at some point outside of the Exposition grounds.

Street Railways—Surface, Subway and Elevated Lines.

There would seem to be an adequate number of lines of street railways to serve this site, as there are trolley terminals for a number of lines at the Dauphin Street entrance to the Park and at Forty-fourth Street and Parkside Avenue, with the Fairmount Park trolley to connect the two rapid transit terminals and distribute visitors at different points in the Park. However, there would have to be extensive improvements made to the Park trolley line in order to make it adequate to handle this business.

Highways.

This site is conveniently located for highways from all sections of the City, as, in the case of the Cret plan, all principal

highways leading into the City are connected with the West Park by improved City streets. There is also sufficient ground within the site and adjacent thereto to provide adequate parking space.

Water Transportation.

As in the case of the Cret site, this would be of minor importance, as there could be no transportation by water, except by small boats on the Schuylkill River.

FAIRMOUNT PARK-PARKWAY PLAN.

This site, as explained earlier, will use adequate territory in Fairmount Park and the Parkway. Though not reported upon specifically herein, due to its late consideration, the Committee joined in ranking the region referred to as the most advantageous for the Fair site (Appendix B). It has the important advantages pertaining to the Lower Fairmount Park or Cret Site in the possibility of having one of its entrances well into the center of the City along the Parkway, while the arrangement for adding territory removes difficulties with regard to parking. Care in laying the site out should make service by various forms of transportation fully comparable in effectiveness with the two other Park sites which have been dealt with above.

The diversion of ordinary traffic, should the Exposition be placed in Fairmount Park and the Parkway, does not seem to offer insurmountable problems or those of such magnitude as would offset the advantages to be gained.

ROXBOROUGH SITE.

This site is nine miles in a direct line from City Hall and can hardly be considered, with present railroad, highway and street car facilities, as being reasonably accessible to the center of the City.

Steam Railroads.

The Schuylkill division of the Pennsylvania Railroad and the Philadelphia and Norristown branch of the Philadelphia & Reading Railway are contiguous to the westerly line of this site, along the Schuylkill River; but as there is a rather abrupt ascent of about 250 to 300 feet from the elevation of the railroad tracks to the general level of the site, at or near Ridge Road, it would be impossible to construct any spur tracks from these branches to the interior portion of the site.

If new railroad construction is undertaken, a branch about three miles in length would have to be built from the Trenton cut-off of the Pennsylvania Railroad and from the Plymouth branch of the Reading for delivery of freight to higher ground and possibly for the use of excursion trains. Excursion train service over the Trenton cut-off would not be satisfactory on account of this being a freight road with dense traffic in busy times; and such a branch if constructed would not be a good feeder for the Pennsylvania Railroad, as the nearest connection with the New York division is at Morrisville, and with the Main Line, Pennsylvania Railroad, at Glen Loch.

Street Railways—Surface, Elevated and Subway Lines.

There are no street railways from the center of the City to reach this site. The nearest line is on Germantown Avenue, with terminus at Chestnut Hill, which transfers passengers to the Schuylkill Valley Transit Company. Facilities for handling passengers on this line would be very limited, and the time consumed in getting from the center of the City to the Exposition would be practically prohibitive.

The Department of City Transit has a proposed elevated and subway line from the center of the City via Twenty-ninth Street and proposed Henry Avenue, that, if constructed, would give reasonably rapid transit service. We believe, however, the City has no intention of constructing this line until more important subway and elevated lines in other sections of the City have been completed.

Electric Railways—Suburban.

This site is accessible from lines running to Norristown, Pottstown, Reading, Easton and Doylestown.

Highways.

This site is accessible to Ridge avenue, which runs directly through the property, and to the Bethlehem Turnpike and Perkiomen Pike or Germantown Avenue. There are also improved highways leading from the Lincoln Highway that would take care of travel from New York, Easton and Doylestown. The main thoroughfares leading from the City are Ridge and Germantown Avenues, neither of which are very good automobile routes, as both have trolley tracks on them. This location, at the present time, is inaccessible from the section west of the Schuylkill River, the nearest bridge over the river being located at Conshohocken, Pa.

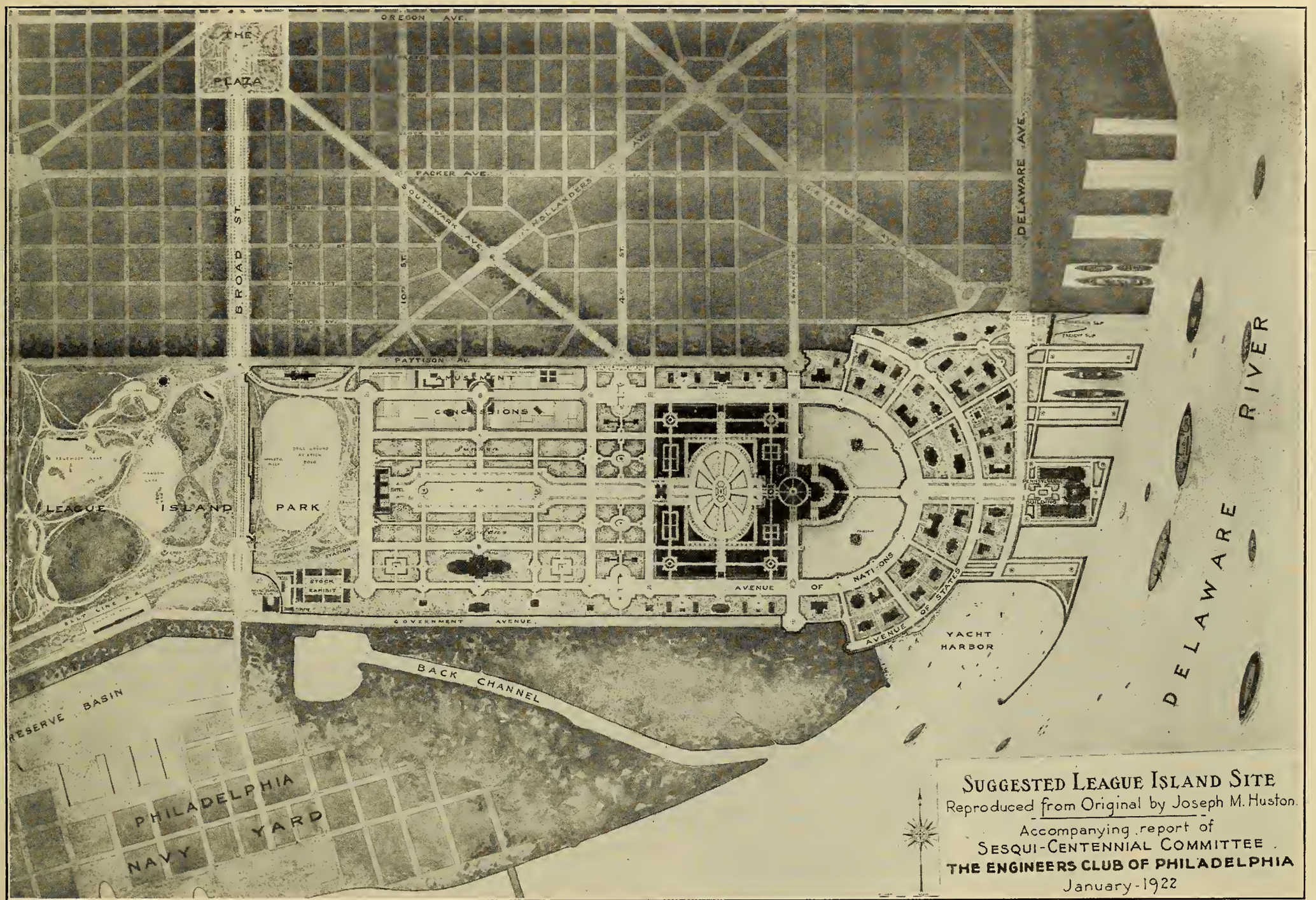

OREGON AVE.
THE PLAZA
PACKER AVE.
SOUTH WARK
HOLLANDERS
DELAWARE AVE.
BROAD ST.
10TH ST.
4TH ST.
PATTISON AV.
AMUSEMENT
CONCESSIONS
LEAGUE ISLAND
PARK
STOCK EXHIBIT
AVENUE OF NATIONS
AVENUE OF STATES
GOVERNMENT AVENUE
YACHT HARBOR
DELAWARE RIVER
BACK CHANNEL
RESERVE BASIN
PHILADELPHIA NAVY YARD
SUGGESTED LEAGUE ISLAND SITE
Reproduced from Original by Joseph M. Huston.
Accompanying report of
SESQUI-CENTENNIAL COMMITTEE
THE ENGINEERS CLUB OF PHILADELPHIA
January-1922

PLATE VIII

Water Transportation.

While the site extends to the Schuylkill River, river transportation would not be practicable.

PENNYPACK PARK SITES.

Three sites embracing Pennypack Park and adjacent land have been proposed. They can be considered as one from the standpoint of accessibility and transportation.

Steam Railroads.

This site could be reached by the Pennsylvania Railroad from its Bustleton branch and by the Philadelphia & Reading Railway from its New York division short lines. Freight could only be handled by the construction of spur tracks from both railroads. Trains on the Bustleton branch of the Pennsylvania Railroad would have to be handled over the New York division, crossing the four main tracks at grade at Holmesburg Junction, which is objectionable from an operating standpoint.

Street Railways—Surface, Elevated and Subway Lines.

The present street railway facilities consist of a trolley line on Frankford Avenue and a line constructed but not operated from the terminus of the Frankford elevated at Frankford to Bustleton. These two lines would provide limited facilities for traffic and we believe a greater proportion of the traffic would have to be handled by the steam railroads than would be reasonably practicable.

Highways.

This site is at the terminus of the Northeast Boulevard, and adjacent to the Lincoln Highway and a number of other improved roads which would take care of the cross-country traffic. Ample parking facilities could be provided.

Water Transportation.

Some weight should be given to water transportation, as it is proposed that a certain amount of river frontage be included in the site, but while ferries and steamboats could be operated there would have to be some means provided for transporting visitors from the water front to the interior section of the Exposition, as the main part of the site is somewhat remote from the river front.

JUNIATA-TACONY PARK SITE.

Steam Railroads.

The Pennsylvania Railroad operates the Oxford Road branch, which is located along the west border of the site where freight and passenger trains could be handled and the necessary terminal constructed.

The Philadelphia & Reading Railway could reach the site by constructing a spur from the Frankford branch, in the vicinity of Castor Road.

A station could be constructed on the Pennsylvania Railroad, New York division, somewhere between North Penn Junction and Frankford Junction and directly south of the proposed site. An objectionable feature from a transportation standpoint is that all incoming and outgoing Pennsylvania Railroad trains would have to be handled on the New York division, crossing the four main tracks at grade, where the normal traffic is very heavy.

Street Railways—Surface, Elevated and Subway Lines.

Transportation by street railways would be principally by means of the Frankford elevated, which is on Kensington Avenue along the easterly side of the proposed site. Extension of existing surface lines in the vicinity of Erie Avenue and Fifth Street could be made to afford additional facilities by surface car lines.

Highways.

This site is not very well located with respect to improved highways at the present time, although it is close to the Northeast Boulevard, and adequate approaches from this highway could be constructed, and it is likely the City would open other important thoroughfares to reach the Exposition. As there is a great deal of vacant ground contiguous to this site, ample parking space could be provided.

Water Transportation.

This site is located at such distance from the river that no water transportation would be available.

LOWER ROOSEVELT BOULEVARD SITE.

This site cannot be rated highly from accessibility standpoint, as it is not close to built-up sections of the City.

Steam Railroads.

The Philadelphia & Reading Railway New York division cut-off is located within the area of the proposed site, and the Pennsylvania Railroad Oxford Road branch is adjacent. Therefore, adequate facilities could be had for handling passenger and freight trains by the construction of a terminal and tracks. The same difficulty of operation, however, applies in respect to the Pennsylvania Railroad that is met with in the Juniata-Tacony Park site—that all incoming and outgoing trains would have to be handled on the New York division, crossing the four main tracks at grade.

Street Railways—Surface, Elevated and Subway Lines.

This site is very poorly located from a street railway standpoint, as there are only two lines that are at present within reasonable distance which could be extended to take care of the traffic.

Highways.

This site, which borders on the Northeast Boulevard, would, of course, have excellent highway approaches, although all traffic centralized on one highway is bound to result in great congestion. Ample parking facilities could be provided.

Water Transportation.

This site is so remote from the Delaware River that no water transportation can be considered.

UPPER ROOSEVELT BOULEVARD SITE.

From a transportation standpoint this site has practically the same rating as the lower Roosevelt Boulevard Site. The two sites are contiguous and, for all practical purposes, should be considered as one.

LEAGUE ISLAND SITE.

This site has a good location along the Delaware River and back channel and adjoins League Island Navy Yard, but from the standpoint of accessibility does not compare favorably with the Cret or Upper Fairmount Park sites.

Steam Railroads.

This site is hardly feasible because the joint line of the Baltimore & Ohio Railroad and Pennsylvania Railroad is constructed directly across it. The Pennsylvania Railroad in 1918-19 constructed an engine terminal about the center of the site at a cost of over one million dollars. If the engine terminal were abandoned during the Exposition and the track removed the Pennsylvania Railroad and Baltimore & Ohio service over Twenty-fifth Street and Delaware Avenue would continue on the present route via Packer Street and Oregon Avenue. Broad Street is bridged over the Pennsylvania Railroad tracks and crosses the Baltimore & Ohio Railroad at grade. All other streets in the city cross these tracks at grade. This site in our opinion should not be seriously considered owing to its interfering very materially with the present and proposed railroad facilities in that section of the City.

Street Railways—Surface, Subway and Elevated Lines.

The Philadelphia Rapid Transit surface lines could be extended from their present terminus north of Oregon Avenue to a point north of Packer Street, but access to the Exposition grounds would have to be by means of overhead bridges over the existing yard tracks of the Pennnsylvania Railroad, which would be inconvenient and make a very poor entrance to the Exposition. The Philadelphia Rapid Transit surface lines west of Broad Street might be carried over the Pennsylvania Railroad tracks by means of temporary bridges and a terminal constructed giving good access to the Exposition main entrance at or near Broad Street. The Philadelphia Rapid Transit can conveniently handle passengers from the Market Street and Frankford elevated lines to this site; and the southwestern trolley line on Penrose Avenue could be extended to this site and would serve Chester and the intervening territory.

Highways.

This site would have fairly good highways serving it. Most of the traffic would undoubtedly use Broad Street and there would be access from West Philadelphia and adjacent suburbs over Passyunk Avenue and Penrose Ferry bridges.

Water Transportation.

Piers and ferry slips could be constructed which would handle traffic from Wilmington, Chester and Trenton, and ferry service installed between Gloucester or some other point on the New Jersey shore which would form a convenient method for people from south Jersey to reach the Exposition.

REVISED LEAGUE ISLAND PARK SITE.

The availability of this site from a transportation standpoint is practically the same as that of the League Island Park Site. It is located north of League Island Park, extends from Broad Street to Delaware Avenue and from Packer to Patterson Streets, and can be enlarged if necessary to include part of the League Island Park Site southwardly to Terminal Avenue, directly north of the joint railroad line.

Steam Railroads.

In order to reach the river front from the main portion of the site it would be necessary to construct a bridge over the tracks of the Pennsylvania Railroad located on Delaware Avenue. The river frontage is now owned and occupied by Pennsylvania Railroad facilities. The agreement between the City and Railroad Company for the elimination of grade crossings in South Philadelphia provides that the City shall purchase the present Greenwich Point Terminal of the Pennsylvania Railroad.

HOG ISLAND SITE.

Steam Railroads.

This site cannot be rated highly from accessibility standpoint. It is outside the City limits and remote from built-up sections of the City. Steam railroad facilities are excellent, as the Pennsylvania Railroad can reach the site from its Sixtieth Street branch and Chester and Philadelphia branch, which connect with the Hog Island Terminal loop; and the Philadelphia & Reading Railway can reach it over their Chester branch, which connects with the branch constructed from their line at Ninetieth street to the Hog Island terminal loop.

Adequate facilities exist within the site at the present time in the way of tracks to provide ample facilities for the delivery of freight and any number of passengers that could be handled by the railroad companies.

The Baltimore & Ohio Railroad could reach this site by the use of the Philadelphia & Reading line, connecting at Eastwick Junction.

Street Railways—Surface, Elevated and Subway Lines.

This site is rather poorly situated for transportation by street railways. There exists at the present time a double track line on Island Avenue, operated by the Philadelphia Rapid Transit Company, and a line on Penrose Ferry Avenue and Island Road. The capacity of these two lines would hardly measure up to the requirements of a large exposition and the construction of any additional lines would be very costly. Therefore, we believe more traffic would be thrown on the railroad companies than could be successfully handled from their stations or terminals in the City.

Highways.

This site would be accessible from the City east of the Schuylkill River over Penrose Ferry Road, and from the City west of the river over Island Road, with the possibility that a new highway might be constructed from Passyunk Avenue to the proposed site. Ample parking space could be provided at the site of the Exposition or on City property adjacent.

Water Transportation.

The possibilities of water transportation to this site are excellent. Existing piers would provide means for taking care of the boat traffic from Wilmington, Chester and Trenton and other points along the river, and a ferry slip could be constructed and a ferry operated between Gloucester and the Exposition, taking care of automobile and other traffic from points in New Jersey.

Electric Railways—Suburban.

This site could be well served with regard to suburban electric railways for people in Chester and that portion of Delaware County west of Hog Island.

CANNON BALL FARM AND FORTIETH WARD SITES.

These two sites are contiguous to the Hog Island Site, and from the standpoint of accessibility would have nearly the same rating.

Steam Railroads.

The same steam railroad facilities would be available as at Hog Island, with the exception that station and terminal tracks would have to be constructed.

Street Railways—Surface, Elevated and Subway Lines.

These sites would have about the same rating for street railways and be served by the same lines, with the exception that the Fortieth Ward Site would have additional service, being in

close proximity to Elmwood Avenue and Woodland Avenue car lines and close to the present terminus of Passyunk Avenue.

Highways.

These sites would have available the same highways as Hog Island and would probably have the advantage of additional highways opened by the City in the development of this section. There would be no difficulty in providing ample parking space.

Water Transportation.

Cannon Ball Farm Site would enjoy practically the same water front facilities as the Hog Island Site, with the exception that piers would have to be constructed. The Fortieth Ward Site, adjacent to Cannon Ball Farm, is not located as advantageously for water transportation, as steamboats and ferries would have to pass through the Penrose Ferry drawbridge, which, with the congestion on the highway, would mean serious delays to either highway or river traffic.


PENNYPACK
PARK
RHAWN ST
BENSALEM AVE
POQUESSING AVE
HOLME AVE
RHAWN ST
COTTMAN ST
CASTOR AVE
BOULEVARD
Suggested Pennypack Park Plan
Reproduced from Original prepared by Tacony Manufrs Asso
Accompanying report of
Sesqui-Centennial Committee
THE ENGINEERS CLUB OF PHILADELPHIA
January - 1922.

PLATE IX

APPENDIX F

REPORT OF THE COMMITTEE ON POWER AND LIGHT WITH A STATEMENT ON CENTRAL STATION SERVICE, AND THE REPORT ON COMMUNICATION

Sesqui-Centennial Committee,
Engineers' Club of Philadelphia,
Philadelphia, Pa.

To the Chairman:

An Exposition requires a large amount of energy in the form of heat, light and power for cooking, and the heating of some of its buildings, for operating working exhibits, for pumping great quantities of water for lagoons, water basins, fountains and cascades, and for the decorative and spectacular forms of illumination which so powerfully affect the attendance and the impression of the Exposition upon the minds of visitors.

The kinds of power which must be provided are electric, steam, gas, gasoline and oil, and if water-power were available, exhibitors could make an exceedingly interesting display of hydro-electric apparatus in actual operation.

The amounts of power of each kind will vary according to the size and location of the Exposition, the detail plans for grounds, buildings and decorative features, and with the desires of exhibitors.

From the experience of former expositions (see Exhibit I) and the judgment of its members, some of whom have fortunately had considerable experience with expositions, the Committee believes that it will be necessary to provide to the extent of:

Electric Power, 15,000 K. W.
Steam, 5,000 H. P.
Gas, 15,000,000 cubic feet per month.

The amount of gasoline and oil power will depend upon the exhibitors and as both sources can be provided upon any site it is not now necessary to prophesy concerning the maximum amounts needed.

The uses of these forms of power will be approximately as follows:

Electric, from Central Station:

Decorative and spectacular lighting, lighting and power for exhibitors; general service connected with grounds and buildings—heating and cooling.

Electric, from Exposition Plant:

Safety lighting of grounds and buildings.

Gas:

Safety lighting of grounds and buildings; decorative lighting; cooking and heating; for exhibitors using gas appliances and processes.

Steam:

Heating of some of the buildings, such as Administration, Music and Art Buildings; Amusement concessions and the various restaurants.
Pumping; operation of working exhibits; spectacular lighting effects.

Gasoline and Oil:

Driving of engines of exhibitors; trucking connected with care of Exposition grounds and buildings.

THE SOURCES OF POWER.

Electric power in earlier expositions was obtained from a temporary plant within the grounds, the machinery for which was, so far as possible, borrowed or rented from manufacturers who were thus able to make a large and striking working exhibit upon terms mutually advantageous to them and to the Exposition. It was necessary to have this large Exposition plant because the load was too great for the local electric central station to supply. Since those expositions the invention of the Tungsten lamp has lowered the load to one-third and the size of central stations has greatly increased. Therefore, we believe that the bulk of the electric power needed could be obtained from the Philadelphia Electric Company, and only that part supplied from the Exposition's own plant which corresponds to a sufficient lighting of aisles, toilets and exits of buildings and streets, walks and gates in the grounds to insure safety in case of trouble with the central station supply.

Steam for power, heating, cooking and spectacular lighting effects must be supplied from the Exposition's own plant as there is no other source.

Gas should be supplied by the United Gas Improvement Company.

Gasoline and Oil Power will probably all be derived from the engines of exhibitors.

Water Power can be obtained at only one site—the Fairmount Park-Parkway Site—and even there in limited quantity and possibly not at all in extremely dry weather.

The Method of Rating the different sites employed by us is the same as adopted by the General Committee, viz.:

1. To formulate the important items to be considered and sub-items, if any, coming under these.
2. To indicate by figures on a scale of 100, our opinion of the relative importance of, or weight to be attached to, these items.
3. To visit each site and there consider and mark down opposite each item or sub-item a figure representing how closely it approaches practical perfection.
4. To combine these figures with their weights into a single percentage for each site which represents how closely that site approaches practical perfection for the whole item of power and lighting.

The items and method are indicated in Exhibit II.

Practically all the important items can be had at any site by an expenditure of money that is not beyond reason. If there were detail plans available it would be possible to calculate the total costs for each site and evaluate or rate the various sites on the basis of relative total costs.

Under the existing circumstances this cannot be done except for a few items. For these the excess for any item at any site above the probable cost for that item on the site most favorable for that item has been noted.

Moreover, some sites now have or will have soon, facilities that will be needed by the Exposition upon any site. In such cases we have listed the probable amount that need not be expended for the Exposition if it were placed upon this site.

These savings are additional advantages for the sites beyond the percentage ratings and should be used in connection with similar items from reports of other committees to make up the item of "cost" which is one of the list of important items to be considered in the selection of a site.

The Result of the Rating which has been made as above is as follows:

Site	Rating as a per cent. of ideal	Value of equipment not necessary to purchase	Approximate excess cost above the lowest cost on any site, for a few items only
Fairmount Park-Parkway*			
Cret and its enlargement	89.2	$500,000†	—
Upper Fairmount, "Centennial"	86.9	—	$15,000
Southeast Philadelphia, Huston and its enlargement	86.5	—	35,000
Fortieth Ward	86.2	—	95,000
Cannon Ball Farm	81.9	—	150,000
Pennypack Park—Nos. 1, 2, and 3	81.3	—	210,000
Tacony Creek Park	80.3	—	75,000
Hog Island	77.6	15,000	200,000
Roxborough	73.8	—	275,000
Upper Roosevelt Boulevard	68.3	—	270,000
Lower Roosevelt Boulevard	66.9	—	500,000

The Fairmount Park-Parkway Site is the only one with any sizable water power. However, the amount is at best only a few hundred horse-power and this is not sure during dry weather, although this situation will be improved by the contemplated dams to be installed farther up the Schuylkill River.

The new Art Museum will have its own equipment for lighting, heating, gas and water service and if the Exposition were located on the Parkway Site there would be no need of expenditure for such equipment, the saving being some $100,000.

The advantages and disadvantages of the various sites are stated in words, in Exhibit III.

Respectfully submitted,

(Signed) CLAYTON W. PIKE, *Chairman.*
BENJAMIN P. FOSTER,
WM. J. SERRILL,
ALBERT C. WOOD.

Philadelphia, January 11, 1922.

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*Rated highest, but not given specific figures by reason of late consideration.

†There will be a steam plant near this site suitable to act as the Exposition plant previously mentioned, which can be obtained and the Exposition will be saved the expenditure of some $400,000.

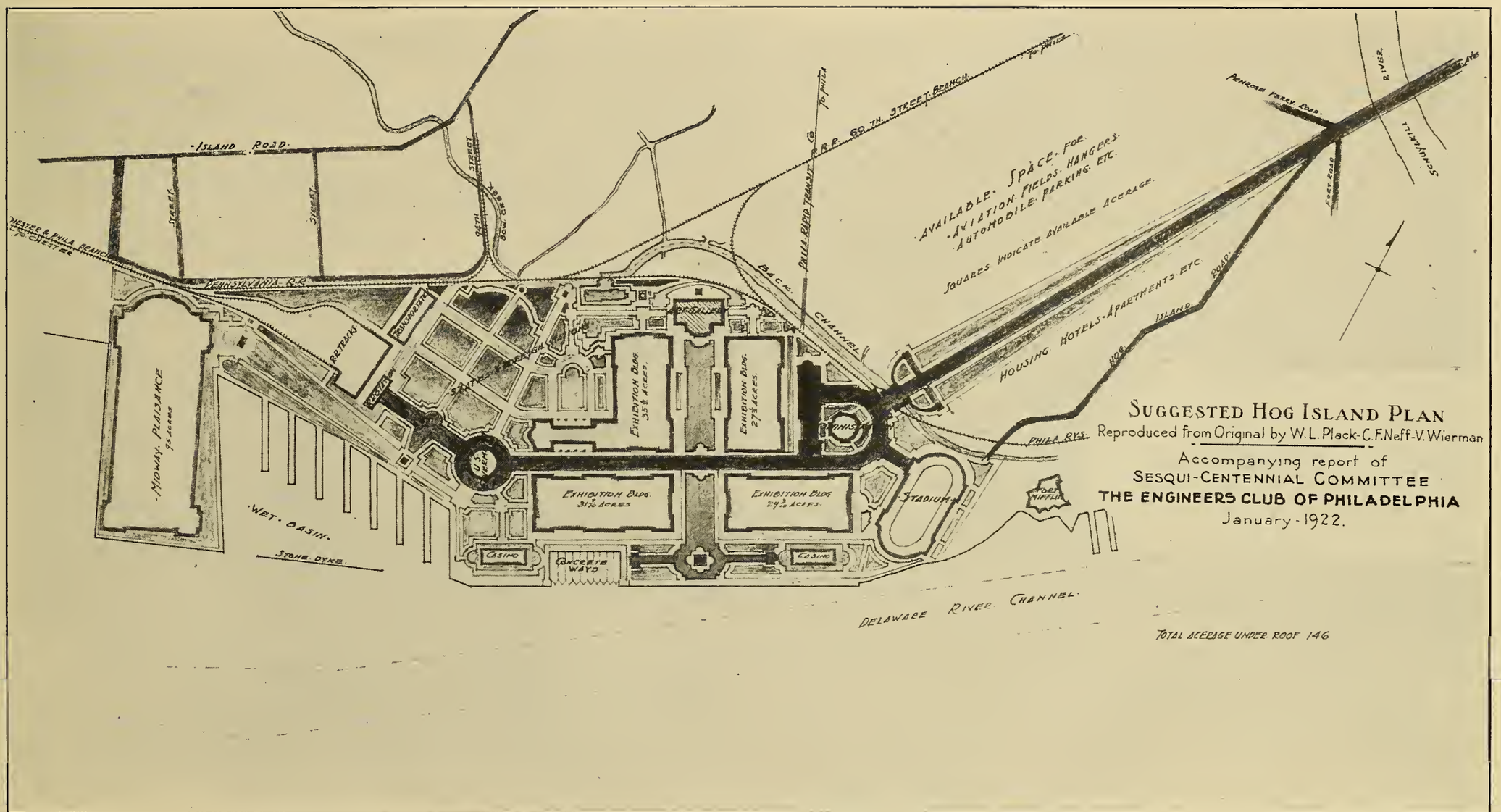
Island Road
Pennsylvania R.R.
Chester & Phila. Branch
To Chester
Midway Plaisance
95 Acres
Wet Basin
Stone Dyke
R.R. Tracks
Penn'a Ry's
Exhibition Bldg.
35½ Acres
Exhibition Bldg.
27½ Acres
Exhibition Bldg.
31½ Acres
Exhibition Bldg.
29½ Acres
Stadium
Casino
Casino
Concrete Ways
Delaware River Channel
Phila. Rapid Transit Co. R.R.
69th St. Branch
To Phila.
Black Channel
Available Space for
Aviation Fields, Hangers
Automobile Parking, etc.
Squares indicate available acreage
Housing, Hotels, Apartments, etc.
Penrose Ferry Road
Schuylkill River
Fort Mifflin
Phila Rys.
Hog Island Road
Total acreage under roof 146
Suggested Hog Island Plan
Reproduced from Original by W. L. Plack-C. F. Neff-V. Wierman
Accompanying report of
Sesqui-Centennial Committee
The Engineers Club of Philadelphia
January-1922.

PLATE X

EXHIBIT I.

QUANTITIES OF POWER, WATER AND GAS USED IN EARLIER EXPOSITIONS, AND ESTIMATED FOR SESQUI-CENTENNIAL EXPOSITION IN 1926.

	Electric K. W. capacity	Steam H. P. additional	Gas cu. ft. daily	Water cu. ft. daily
1893—Chicago	13,000	7,000	157,600	64,000,000
1900—Paris (maximum demand, 11,000 K. W.)	15,000	5,000	647,000	6,470,000
1904—St. Louis	26,000	14,000	small	130,000,000
1915—San Francisco (actual maximum demand, 8,100 K. W.)	15,000	small	486,550	3,500,000
1926—Philadelphia	15,000	5,000	600,000	*

* Depends upon site chosen and landscape plan.

EXHIBIT II.

SESQUI-CENTENNIAL SITE STUDY FORM—POWER AND LIGHTING

Site Proposed ----------

1	2	3	4	5	6	7	8	9	10	11
	Relative importance of each item studied			Rating of site %	Combination of rating and relative importance					
					5 x 2	Wgt. av.	7 x 3	Wgt. av.	9 x 4	Wgt. av.
Exposition steam plant	—	—	30	—	—	—	—	97.7	29.3	—
Fuel	—	30	—	—	—	92.5	27.7	—	—	—
Supply	70	—	—	100	70.0	—	—	—	—	—
Storage	30	—	—	75	22.5	—	—	—	—	—
Water	—	60	—	—	—	100.0	60.0	—	—	—
Boilers	10	—	—	100	10.0	—	—	—	—	—
Condensing	90	—	—	100	90.0	—	—	—	—	—
Ash disposal	—	10	—	100	—	100.0	10.0	—	—	—
Distribution	—	—	20	—	—	—	—	80.8	16.1	—
Free of rock	—	65	—	100	—	100.0	65.0	—	—	—
Dry soil	—	35	—	45	—	45.0	15.8	—	—	—
Gas	—	—	30	—	—	—	—	68.5	20.5	—
Supply to grounds	—	25	—	26	—	26.0	6.5	—	—	—
Internal piping underground	—	25	—	70	—	70.0	17.5	—	—	—
Internal piping above ground	—	15	—	90	—	90.0	13.5	—	—	—
Metering and governing	—	15	—	90	—	90.0	13.5	—	—	—
Utilization appliances	—	15	—	90	—	90.0	13.5	—	—	—
Maintenance	—	5	—	80	—	80.0	4.0	—	—	—
Gasoline and oil	—	—	10	—	—	—	—	87.0	8.7	—
Supply	—	70	—	90	—	90.0	63.0	—	—	—
Storage	—	30	—	80	—	80.0	24.0	—	—	—
Water	—	—	10	—	—	—	—	30.0	3.0	—
Quantity available	—	30	—	100	—	100.0	30.0	—	—	—
Head	—	50	—	—	—	—	—	—	—	—
Improved water power available	—	20	—	—	—	—	—	—	—	—
									77.6	
Final relative rating of site	—	—	—	—	—	—	—	—		77.6%

Value available equipment:	
Sub-station apparatus	$15,000
Excess cost over minimum:	
Installation (foundations)	$5,000
Pumping	—
Steam distribution	10,000
Gas—supply to grounds	209,000
Total excess	$214,000

EXHIBIT III.

ADVANTAGES AND DISADVANTAGES AS TO POWER AND LIGHTING OF THE VARIOUS SITES.

Advantages	*Disadvantages.*
LOWER FAIRMOUNT—FAIRMOUNT PARK-PARKWAY.	
Art Building has own light, water and gas equipment. Separate steam and electric plant is available for exposition use. Dry soil for underground distribution. Some water power available. Lighting effects more beautiful than on a flat site.	Some rock and tree roots.
UPPER FAIRMOUNT.	
Dry soil. Lighting effects more beautiful.	Underground work more costly owing to tree roots.
SOUTHEAST PHILADELPHIA.	
Free from rock or tree roots.	Wet soil for underground steam. Poor foundations.
FORTIETH WARD.	
Free from rock or tree roots.	Wet soil for underground steam. Poor foundations.
CANNON BALL FARM.	
Free from rock or tree roots.	Wet soil for underground steam. Poor foundations.
PENNYPACK PARK.	
Dry soil. Good Foundation. Better lighting effects than on flat site.	Height to pump water.
TACONY CREEK PARK.	
Dry soil. Good foundation. Better lighting effects than on flat site.	Height to pump water.
HOG ISLAND.	
No rock. Sub-station apparatus available.	Wet soil for underground steam. Poor foundation.
ROXBOROUGH.	
Dry soil. Good foundations.	Height to pump water. Distance to transport materials. Distance to transport workmen.
UPPER ROOSEVELT BOULEVARD.	
Dry soil. Good foundation.	Little water.
LOWER ROOSEVELT BOULEVARD.	
Dry soil. Good foundation. Free from rock, etc.	Little water.

SUPPLY OF CENTRAL STATION POWER

Mr. W. C. L. Eglin was appointed to report upon availability of central station power at the Fair sites. After such study as was required for the purpose he reported to the Sesqui-Centennial Committee of the Engineers' Club of Philadelphia that sufficient power for Exposition purposes could be supplied without serious difficulty from the central station service of the city at any of the sites. He stated further that the variation in cost in supplying the necessary power at the needed points where the Exposition might be located was not of sufficient moment to warrant making a detailed report.

REPORT ON COMMUNICATION

Sesqui-Centennial Committee,
Engineers' Club, Philadelphia.

To the Chairman:

Forwarded herewith is a tabulation showing the ratings of the various sites proposed for the Sesqui-Centennial Exhibition from the standpoint of communication facilities and service. In preparing these ratings various factors have been given consideration, as follows:

1. Estimated gross and net expenditures necessary for each site on the part of the various communication companies to care for the temporary increase in traffic before and during the Exposition.
2. The expenditures necessary to adequately connect each of the sites with the systems of the several communication companies.
3. The cost of necessary plant within each of the sites.
4. The availability of the investment specified under Nos. 1, 2 and 3 above, for use after the close of the Exposition.
5. As the following factors are estimated to be the same regardless of the site selected they have been considered as constant factors and do not appear in the ratings:
   (a) Costs of handling traffic.
   (b) Messages and message charges.
6. In all cases the installation of loud-speaking equipment has been assumed. This equipment is one of the later developments in the art of communication which is particularly useful for exhibition purposes. By means of this apparatus the size of an audience which can be ad-

dressed by a single speaker is increased many fold, and several audiences may be addressed simultaneously by a single speaker, who may be far distant from any of them.

7. Wireless communication. This means of communication was considered as a constant factor for all sites, the only difference being one of relatively slight cost for foundations, erection, etc.
8. It has been assumed that satisfactory postal facilities will be provided by the Government at any site. As far as known there will be no substantial variations in the cost of different sites, with the exception that if an aeroplane mail service is featured this would require in the case of certain of the sites the provision of nearby landing fields outside of the grounds, while for other sites a portion of the grounds could be so utilized.

These ratings and the details from which they were prepared are based on previous experience at other Fairs, particularly the Panama-Pacific Exhibition at San Francisco, and the World's Fair at St. Louis, with the proper corrections necessary to adapt this experience to the local situation.

Respectfully submitted,

(Signed) J. C. KILPATRICK, *Chairman.*
Communications Committee.

RATINGS OF PROPOSED SITES FROM THE STANDPOINT OF COMMUNICATION.

	Rating on the Basis of Necessary Investment by Communication Companies	Rating on basis of Expenditures to be borne by the Exhibition	Rating on Basis of Salvage Sites	Final Rating
1. Pennypack Park	85	88	95	85
2. Upper Roosevelt Boulevard	88	88	99	88
3. Lower Roosevelt Boulevard	89	97	99	90
4. Juniata and Tacony Park	90	100	99	92
5. Roxborough	84	75	93	82
6. Upper Fairmount Park	88	97	99	90
7. Fairmount Park-Parkway	100	95	100	99
8 and 9. League Island	88	79	100	86
10. 40th Ward—North Plan	87	86	90	87
11. 40th Ward—South Plan or Cannonball Farm	86	77	90	85
12. Hog Island	86	93	90	87
Weighting Factor	10	2	½	

TELEPHONE EXPERIENCE AT PREVIOUS EXPOSITIONS.

PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

SAN FRANCISCO—1915.

The Exposition.

Grounds comprised 635 acres divided into three sections. The section to the west of the center section contained the various State buildings and those of the foreign nations. Beyond these buildings were located the livestock exhibit building and the race course. To the east of the center section was situated the zone consisting of amusement and restaurant concessions.

The Buildings.

The main exhibit palaces, eleven in number, formed a central setting, eight of which structures comprised the main group. The eight palaces, although separated, were connected by courts and avenues and were constructed in rectangular form.

Telephone Plant and Construction.

The telephone cables were run in the same conduit as the light and power cables. Conduit made of 3-inch fiber duct, having walls ⅛ inch thick, and ducts laid in wooden boxes and the spaces between the ducts filled with sand and sluiced into place through a hose.

Total amount of duct laid for light, power and telephone requirements was 424,000 duct feet, being 36,000 trench feet. Average cost, 19 cents per duct foot.

The manholes, numbering 150, were of timber construction.

For telephone service 2-inch black iron pipe with burrs reamed was used.

The underground system required about 41,000 feet of cable, of which 4,500 feet was 400 pairs.

The trunk lines connecting the Exposition with the Telephone Company (west office) had a capacity of 1,200 pairs.

The Switchboard.

Located in a room covering an area of about 2,400 square feet; 5 sections of 15 positions of a Standard No. 1 switchboard, including a complete storage battery plant with changing generator and ringing machines. Also installed a No. 6 central office desk and a four-position information desk.

Switchboard equipped with six-panel multiple and auxiliary answering jacks and 200 incoming and 60 outgoing trunks. An operators' rest room was also provided.

The equipment at attended public stations consisted of from 5 to 10 booths, which were built by the Exposition Company and were wired to a Standard No. 4 P. B. X. switchboard.

Telephone Equipment in Use.

18 Positions, No. 1 P. B. X. Switchboards.
377 Primary Stations.
89 Extension Telephones.

140 Trunks.

60 Sending to West Office.
39 Receiving to West Office.
7 to Long Distance.
2 to Long Distance Recording Board.

30 to Kearney Office, which serves the business section of San Francisco.
2 Information.
139 Coin Collectors.
4-position Information Desk.
2-position Chief Operator's Desk.

Auxiliary P. B. X.'s:

33 No. 4 P. B. X. Switchboards.
60 Trunks.
*1068 Primary Stations.
128 Extension Telephones.
27 Coin Collectors.

Line and Station Development Attributed to the Existence of the Exposition:

Temporarily gained, 180 lines.
Temporarily gained, 1,375 stations.
This development existed only during the life of the Exposition.

Calling Rate	*Entire City*	*West Office*
Second Year before Fair	5.0	8.3
Year before Fair	5.4	9.3
Year of Fair:		
January	5.7	9.4
February	5.7	10.9
March	5.8	10.1
April	6.0	9.8
May	6.0	9.6
June	5.5	8.4
July	4.9	7.3
August	5.3	8.1
September	5.4	8.6
October	5.4	7.7
November	5.5	8.6
December	5.6	10.5
Average for Year	5.6	9.1
Year after Fair	5.3	8.8

*367 Located in Hotel (The Inside Inn).

ST. LOUIS WORLD'S FAIR—1904.

Telephone Plant and Construction.

The World's Fair Administration furnished wooden conduit for cables and the Telephone Company furnished the cables for the conduit, retaining ownership in the cables. The cables were withdrawn after the period of the Fair.

The Switchboard.

Complete C. O. system of about 4-A section and 3-B sections of No. 1 equipment was installed, together with complete distributing frames, power plant and Chief Operator's desk. (18 positions.)

Telephone Equipment in Use.

Switchboard listed above.
About 600 stations connected to the central office.
About 30 P. B. X's.
Administration building P. B. X. of about 200 stations and 30 trunks.

Line and Station Development Attributed to the Existence of the Exposition.

Line and station growth for the city shows a decided increase during the period of the Fair, a considerable portion of the increase being permanent.

Calling Rate	*Entire City*	*Forest Office*
Second Year before Fair	8.4	5.2
Year of Fair:		
January	8.6	5.1
February	8.5	5.6
March	7.9	4.9
April	8.9	7.7
May	8.3	5.8
June	8.5	6.3
July	8.3	4.9
August	7.2	4.6
September	8.5	5.9
October	8.4	6.4
November	7.6	5.7
December	7.4	5.4
Average for Year	8.2	5.7
Year after Fair	6.9	5.0